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ABSTRACT

The Pennsylvania Department of Public Instruction developed an information storage and retrieval system called PRIMES (Pennsylvania Retrieval of Information for Mathematics Education System). This system, designed to aid in elementary mathematics curriculum planning and implementation, was offered cost free to school districts; however, almost 90 percent of the invited districts chose not to participate. Focusing on the decision-making process in school districts, this study attempted to discover factors responsible fcr the large rejection rate. The main finding was that acceptance or rejection of the project was based largely on the degree of familiarity with the project. Administrators most likely to reject the prcject were those who had received little or no information about it. (Appendix C -- sample copy of PRIMES brochure -- may reproduce poorly because of marginal legibility.) (RA)

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AN ASSESSMENT OF THE DECISION MAKING PROCESS RELATED TO CURRICULUM INNOVATIONS WITH PUBLIC SCHOOL SYSTEMS IN SOUTHEASTERN PENNSYLVANIA

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West Chester State College
West Chester Pennsylvania

August 1970

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Chapter I

THE PROBLEM AND ITS SCOPE

CURRICULA, RESEARCH, AND TECHNOLOGY

Effective educational systems develop the potential abilities and meet the individual needs of students. Obviously therefore, before a curriculum planner can design curricula to achieve these goals, he must first determine the potential abilities and needs of the students and then select the most effective instructional methods to achieve the goals. Unquestionably, educational research provides the vital information for planning successful curricula.

Furthermore, the rate at which society changes increases continuously; if education is to keep pace with society, more and more educational research will have to be performed. Many sources have cited the need for research projects to adequately meet the growing demands societal changes make upon our schools. Then too, when research yields significant results and indicates potential programs, these findings must be tested within the schools. The Philadelphia Suburban School Study Council cites four major factors which demand such research and implementation.

- Increases in school population (Present school population will double by the time the present first grader is forty years old.)
- The mobility of the American population (One-fifth of the American population changes residence each year.)
- Rapid increase in the amount of knowledge (By the year 2000 there will be 2000 times as much to know.)
- Explosion in technology and invention[1]

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[1] Philadelphia Suburban School Study Council, Improving Today's Curriculum for Tomorrow's Challenges (Danville, Ill.: Interstate Printers and Publishers, Inc., 1964), p. 12.

This "explosion in technology and invention" has produced a society which will become increasingly more technologically oriented. As a result, technological considerations will play an increasingly larger part in educational decisions. Finn presents three reasons for the inevitable integration of education and technology.

> First, in a society in which science and technology are primary, such as America, the society requires that the educational system insure an adequate supply of scientists and associated technicians. . . . Second, as a society becomes more and more technologically oriented and controlled, the question of the general education of all the citizens is raised. . . . Third, because of the tendency for technology to have no limits and constantly to extend to new areas, it is inevitable that, in an advanced technological society, technology should begin to extend into the educational process itself.[2]

Ideally, technology should not be considered another obstacle for education to overcome; rather, education should take full advantage of the tools which technology offers.

Today, school administrators--those who are responsible for adapting the educational system to contemporary society--are faced with an explicit obligation. Stephen Corey notes this obligation of professional educators when he writes:

> Our rapidly changing culture and its implication for curriculum change, the continuous increase in pupil enrollments and numbers of teachers, the need for improved school leadership, the continuous additions to knowledge in general and particularly our knowledge about children and youth, mean that the professional school people need to work continuously to keep abreast of what they must know and must be able to do.[3]

Bearing in mind the obligation of school administrators and the interrelationship of curricula, research, and technology, the circumstances of a curriculum innovation offered to school districts in southeastern Pennsylvania.

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[2] James D. Finn, "A New Theory for Instructional Technology," Audio-Visual Communication Review (1960), p. 84.

[3] Stephen Corey, "In-Service Education," 1957 Yearbook of the National Society for the Study of Education (Chicago: 1958), p. 1.

A COST-FREE PROJECT IS REJECTED

In 1968, after working for three years with experts in education, research, and mathematics and investing over $150,000, the Pennsylvania Department of Public Instruction (subsequently renamed the Department of Education) developed a computerized information storage and retrieval system for published materials including audio-visual materials, in elementary-school mathematics. Strongly supported by nationally recognized leaders in elementary-school mathematics education, this system can aid in the development and implementation of elementary-school mathematics curricula by informing curriculum planners of available methods and resources in elementary-school mathematics. This project, offered free to school districts in Pennsylvania, is called PRIMES--Pennsylvania Retrieval of Information for Mathematics Education System.

Description of PRIMES

The PRIMES file was compiled through the analysis of all the texts contained in the twenty basal-mathematics series existing when the work for the project was carried out. In addition, accompanying teacher's manuals, tests, special features, films, filmstrips, manipulative aids, and pretext and posttext activities were also analyzed. To perform these various analyses, two instruments were designed especially for PRIMES--the Content Authority List and the Behavior Authority List.

The Content Authority List contains all the basic mathematics concepts taught at the elementary level. This list is so comprehensive that texts used to train teachers of elementary-school mathematics can be analyzed with it. Each content item is code numbered for computer storage. With this master list, containing over three hundred items, every page of the basal texts was analyzed; every independent concept item found on a page was coded according to the list and recorded on IBM index cards.

The second instrument, the Behavior Authority List, analyzes the behavioral objectives expected to be met in the teaching of a lesson. Each behavioral objective is observable and measurable; and like the content items, each behavioral objective is code numbered for computer storage. The Behavior Authority List contains approximately sixteen hundred items.

Again, each lesson of every text was analyzed for behavioral objectives; in addition, the context in which the behavior was to be observed was also recorded.

After the analyses were completed, the PRIMES file consisted of over 25,000 microfilm aperture cards containing pupil-text pages, teacher's-manual pages, and content and behavior analyses of all the pages. All items contained computer-generated indexes to access the file.

Introduction of PRIMES

To test the effectiveness of PRIMES, several pieces of information--including an illustrated brochure--were sent to the chief administrators of the school districts in the southeastern Pennsylvania Counties of Chester, Delaware, and Montgomery. Subsequently, these administrators and their appropriate staff members were invited to attend conferences sponsored by the Department of Education to explain the services offered by PRIMES and to solicit participation in the project. After these initial presentations, follow-up meetings were held with each school administrator who indicated an interest in the program.

Realizing that PRIMES was offered without charge, and that most school districts functioning individually could not produce from their own resources the services offered by PRIMES, consider the fate of the project. Of the fifty-seven local school districts invited to attend PRIMES conferences, only thirty-six districts sent representatives. But regrettably, especially in view of the current revolution in elementary-school mathematics programs and the concomitant problems of curriculum development and teacher training, only seven school districts--about twelve percent of the districts invited--elected to participate in the PRIMES project.

Why did so many school districts reject the PRIMES project? The project was developed from thorough research by outstanding personnel. The system used the latest technological developments of data processing and information storage. PRIMES offered a practical solution to the problem of planning curricula and selecting instructional materials for elementary-school mathematics programs--programs which must be carefully planned to take full advantage of the new concepts in mathematics education. Perhaps the answer rests within the decision-making process itself.

THE DECISION-MAKING PROCESS

Traditionally, the chief school administrator, with the consent of the local school board, made curriculum decisions. But now, such factions as administrative-level curriculum specialists and curriculum committees have voices in the decision-making process. While these persons are individually qualified to make decisions about curricula, decision-making by groups requires good intergroup organization and effective channels of communication; at times, faulty organization and communication impedes the decision-making process. In addition, one individual must ultimately be authorized to resolve differing opinions in such a decision-making situation by stating which opinion will be the final decision; otherwise, no decision will be reached. In considering a decision to be made about curriculum then, one must determine who actually makes the decision.

The textbook answer to the question of who makes curriculum decisions would state that the superintendent, upon the advice of the assistant superintendent in charge of instruction (who leads a curriculum-study group), with the permission of the school board, makes the decision. But school districts vary greatly in size and administrative staffing. In many cases the superintendent has no curriculum consultants at his disposal; he is the decision maker. In larger districts, several curriculum specialists may be employed. Some may work full time on matters of curriculum; others may be classroom teachers on release time. Additionally, the amount of responsibility given to these curriculum specialists for making decisions varies greatly from district to district.

A curriculum project designed for a large number of school districts must be sufficiently flexible to meet the different needs of the various districts. Just as individual differences exist among students in a classroom, so do individual differences exist within a group of school districts. In the case of the innovator proposing a curriculum project to a group of school districts, one of the individual differences with which he must deal is the variety of methods used in making decisions. The likelihood of acceptance by school districts of innovative curriculum programs will be increased if the directors of these programs knew more about the decision-making processes of the potential users of the programs.

THE OBJECTIVES OF THIS STUDY

The objectives of this study are twofold. First, the study attempts to discover the factors affecting the decision-making process which led to the acceptance or rejection of the PRIMES project. Second, the study attempts to extend these findings to aid in the introduction, dissemination, and implementation of other innovative curriculum programs. Specifically, the study sought to answer the following questions.

About the Decision-Making Process

- What is the nature of the decision-making process used by a particular school district?
- How is curriculum information disseminated within a school district?
- What factors of the PRIMES project were or were not fully understood?
- Did strengths or weaknesses of programs already functioning in individual school districts affect the decision to accept or reject PRIMES?
- What services or materials could be added to the PRIMES project to make it more appealing?
- Could further presentations of the project and its offerings change a decision not to participate in PRIMES?

About the Decision Makers

- What administrative organization exists within a school district for the consideration of curriculum matters?
- Who attended the PRIMES presentations?
- If the superintendent did not attend, to whom did his representative report?
- Who was the most influential person in deciding to accept the PRIMES project?
- Are factors such as the years of service and educational background of the chief school administrator relevant to the acceptance or rejection of PRIMES?

The data collected will be the basis for developing a model plan to gear the PRIMES project to the specific needs and characteristics of local school districts. In general, however, the findings should be valuable in three ways:

- To contribute to general educational development by adding to the national research dealing with the process of change and its relationship to the area of curriculum development
- To modify the approach used in the future in presenting innovative curriculum ideas to local school districts
- To help local school districts locate potential obstructions to innovation and to aid them in understanding the signposts of change

Chapter II

RELATED LITERATURE

This chapter discusses publications which supplied background material, support, direction, or justification for the project reported in this paper. The literature reviewed in this chapter is divided into three major sections: innovation, decision making, and communication.

The first section treats literature which stresses the need for innovation in education and cites some of the pitfalls in implementing these new ideas.

INNOVATION

Rogers recognizes the need for innovation in an educational institution and offers much sound direction when he points out that central to any notion of change, adaptability, or self-renewal is the introduction of new ideas into the already-existing system. He points out that the system must be open and flexible and allow for input from the external environment. Such input creates a self-renewing environment. He notes that the body of research dealing with the diffusion and infusion of innovations has a relevance for self-renewal.[1] Rogers also cites four elements central to diffusion:

- An innovation
- Communicated via certain channels

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[1] E. M. Rogers, "Communication of Innovations in a Complex Institution," Educational Record, Winter 1968, pp. 67-77.

- To members of a social system
- Who adopt it over a period of time[2]

He further discusses the variables which affect the acceptance or rejection of an innovation. They are the situation, the personality, the social, and economic status of the adopter, the lines of communication used, and the innovation itself.

Lippit stresses four specific aspects of the change or innovative process that seem to be responsible for minimizing the impact of change:

- Most significant changes in practice imply and require some changes in attitudes, skills, and values of the practitioner.
- A great portion of the new innovations remain invisible, undocumented, and inaccessible to potential users.
- Educators believe that they should be their own inventors and to use others' contributions would lead to loss of status in the eyes of colleagues.
- Education lacks a professional network of communication and of agents of change.[3]

Rogers clearly stresses five necessary characteristics for the adoption of an innovation:

- Relative advantage is the degree to which the innovation is visibly better than the idea it supersedes.
- Compatability is the degree to which an innovation is consistent with the existing values and past experience of the adoptors.
- Divisibility is the degree to which an innovation may be tried on a limited basis.
- Complexity is the degree to which an innovation is relatively difficult to understand and to use.

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[2] E. M. Rogers, *op. cit.*, p. 68.

[3] Robert Lippit, "Rules and Processes in Curriculum Development and Change," *Strategy for Curriculum Change* (Washington, D.C.: Association for Supervision and Curriculum Development, 1965), pp. 11-28.

- Communicability is the degree to which the results of adoption or rejection of an innovation are visible to others.[4]

Pye further notes that our scales of judgment are heavily anchored in our past experiences and that new stimuli are generally located along particular dimensions of judgment by comparative processes. Any idea that does not seem compatible with prevalent values or norms will not be adopted as readily as an innovation that is compatible.[5]

Daniel P. Moynihan wrote in the Harvard Educational Review that it is commonplace in the history of science that the appearance of new information is often followed by an intense struggle to have it accepted.[6] This would be the case in the social sciences as well.

The problem then seems to take on the added dimension of to whom the innovation shall be presented and in what form it shall be offered to the potential user. In the case of a curriculum innovation, it would be reasonable to present the innovation to the individual who decides whether or not the innovation is to be implemented in his school district. Who this person is and whether he alone may make t the decision necessitates an investigation of the decision-making process.

DECISION MAKING

A decision has been defined as that phase of mental activity in which a volitional tendency reaches its completion. The word is commonly used only where there has been some deliberate choice.[7] Decision making can be viewed as the action or actions performed by the individual in making that deliberate choice.

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[4] E. M. Rogers, op. cit., p. 72.

[5] Louis W. Pye, Communications and Political Development (Princeton, N.J.: Princeton University Press, 1963), p. 141.

[6] Daniel P. Moynihan, "Sources of Resistance to the Coleman Report," Harvard Educational Review, Winter 1968, pp. 23-37.

[7] A Cyclopedia of Education, ed., Paul Monroe (New York: MacMillan Co., 1926), p. 370.

Rogers categorizes the various types of decisions made in consideration of the acceptance or rejection of an innovation:

- Optional Decisions--Decisions made by an individual regardless of the decision of other individuals in the social system. Even in this instance, the individual's decision is no doubt influenced by the norms of his social system, his need to conform, or by other pressures.

- Contingent Decisions--Decisions which the individual may adopt an innovation only after a majority of his social system has already made an adoption decision; he is not forced, however, to conform to the group decision.

- Collective Decisions--Decisions in which individuals in the social system agree to adopt or reject by consensus, and all must conform to the system's decision once it is made.

- Authority Decisions--Decisions forced upon an individual by someone in a superordinate position. The attitudes and opinions of the individual toward the innovation cannot affect the course of events; he is simply told what behavior is expected of him.[8]

Griffiths inseparably links decision making to the administrative process. He proposes a theory of administration built on the key concept that the distinquishing characteristic of administration is that of directing and controlling the decision-making process.[9] The decision-making process is construed to mean not only the decision, but also the acts necessary to implement the decision.

Goodlad notes that in the current welter of curriculum activities discovering who does make curriculum decisions, to say nothing of defining who should make curriculum decisions, would be most useful. He points out that a review of the curriculum bulletins issued by state departments of education would present a vastly confused picture over who should make what curriculum decisions. Curriculum bulletins are a potpourri of vague statements of educational aims, principles of child development, weekly time specifications for each subject, and suggested activities and technics for the art of teaching. At central issue seems to be the question of whether or not some curriculum decisions are the domain of the departments of education. Perhaps if those decisions were concentrated upon by the departments they could be executed superbly. Obviously other decisions are the domain of the local school districts while still others are decisions to be made by professional staffs or federal offices. Goodlad cautions that until these questions are worked through, curriculum planning in America, with all its attributes, will continue to be much less effective than it should be.[10]

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[8] E. M. Rogers, op. cit., p. 71.

[9] Daniel E. Griffiths, Administrative Theory (New York: Appleton-Century Crofts, Inc., 1959), p. 28.

Bishop reinforces Goodlad's concern when he notes that there seems to be an educational conflict developing, caused in part by increasing specialization, that results in the question, "Who shall make the decisions?" More and more decisions are complex and require specialized backgrounds and education in order to bring the most relevant issues and knowledge to bear upon the question. Of course in the specialist's view, he is the only one in command of the knowledge of the alternatives; the generalist, however, believes each decision requires knowledge of the vast arena and all other elements in the system must be considered. Between the two positions seem to exist information and action voids resulting from different perceptions, knowledge, and consequences of the major considerations necessary to make a decision.[11]

Willower notes another dimension of this conflict. The chief school administrator of a school district is most frequently considered a generalist, yet he must sit in the unenviable position of making decisions after weighing the sometimes conflicting recommendations. An additional factor to be considered is the relative complexity of decision making in large organizations. Other complicating factors are coordination, communication, accountability, and interunit conflict.[12]

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[10] John I. Goodlad, "Curriculum Decisions: By Whom, and What For?," Nations Schools, March 1965, p. 42.

[11] Leslee J. Bishop, "Educational No-Man's Land," Educational Leadership, December 1967, p. 214.

Hamachek supports Willower by pointing out that the decision makers are burdened with responsibilities for curriculum, teacher supervision, board meetings, community meetings, evaluations, staffing, pupil progress, guidance, records, discipline, transportation, public relations, budget, and a host of other commitments.[13]

Comprehensive perception of the situation and the ability to make decisions, as noted by Hartley, are the marks of an effective school executive. Hartley warns that in an analysis of unanticipated consequences, it is important for the administrator to consider the unit for which his decision will have designated consequences; the superintendent's decision may have diverse effects upon the various units under his supervision.[14]

The National Education Association notes twelve primary decision areas; foremost among them is one titled "Decision Making: Who should make what decisions about education?" Four of the basic recommendations under this decision area are particularly germane:

- Local school boards are the legal instruments through which the state fulfills its responsibility for education. The distinction between lay control of school policies determined by the board of education and implementation of these policies by the professional staff, with the leadership of the local superintendent, should be delineated, understood, and respected.

- Local school faculties should have the freedom and the authority to make decisions about what to teach--within state and local requirements--and how to teach. Final instructional decisions should be made by the teacher, taking into consideration recommendations from appropriate local, state, and national groups representing the teaching profession, academic scholars, and the public.

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[12] D. C. Willower, "Lay and Professional Decisions in Education," Peabody Journal of Education, January 1964, p. 22.

[13] D. E. Hamachek, "Leadership Styles, Decision Making, and the Principal," National Elementary Principal, XLV (April 1966) 26-31.

[14] Harry S. Hartley, "Administrative Decisions and Functional Analysis," Education, January 1969, p. 276.

- State educational authorities should establish standards for public-school instruction, provide adequate resources for their achievement, and give dynamic leadership to curriculum development, experimentation, and innovation in local schools.

- State legislatures should set forth general goals for the schools, provide adequate financial support, and delegate broad powers of implementation to the state and local educational authorities. The state legislature should not prescribe curriculum content or legislate specific courses.[15]

Menkin believes that the best-laid plans, along with the most careful attention to the need and interests of the members of the group being serviced, are lost in the process of communicating the developmental plans. He points out that communication is an interpretative process and that words mean different things to different people. He notes also that the receiver listening to a message "selects out" that which is meaningful to him.[16]

COMMUNICATION

The Dictionary of Education defines communication as the process whereby a human society continues to exist by transmitting its values, concepts, attitudes, habits, and skills (nonmaterial cultural components) so that the young may participate in the common life.[17]

Delehanty points out that communication occurs only when people listen to each other with understanding.[18] Rogers adds that a listener must be able ". . . to see the expressed idea and attitude from the other person's point of view, to sense how it feels to him, to achieve his frame of reference in regard to the thing he is talking about." [19]

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[15] National Education Association, Schools for the Sixties (New York: McGraw-Hill Book Co., 1963), p. 146.

[16] P. Menkin, "Best Laid Plans . . .," Adult Leadership, June 1967, p. 47.

[17] Carter V. Good, Dictionary of Education (McGraw-Hill Book Company, Inc., New York, 1959).

Bristow, like Menkin, suggests that words and ideas have meaning only in terms of the individual's experiential background, present situation, needs, and drives. It is assumed that people generally understand what has been said or written, but very often this is not the case; frequently no opportunity is provided for further explanation of new meanings in order to gain background for the given idea. He further notes that research has played too little a part in curriculum communication and decision making. Good curriculum goes beyond usual educational research. It cannot be fragmented. It necessitates a design and pattern different from the usual approach to educational research.[20]

Smith and Burk stress that communication is a professional responsibility shared by classroom teachers, supervisors, coordinators, principals, administrators, and the superintendent of schools in his function as professional leader. There must be a joint effort in exploring together the needs of the schools, the teachers, and the community. Existing programs must be reviewed and common goals developed. There is a particular need to understand one another's responsibilities and for all to work toward keeping open channels for constant cooperation. The media of communication must be carefully selected to meet the purpose intended.[21]

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[18] D. Delehanty, "Communication with your Staff," Catholic School Journal, March 1968, p. 47.

[19] Carl Rogers, "Barriers and Gateways to Communication," Studies in Personnel and Industrial Psychology (New York: The Dorsey Press, Inc., 1967), p. 410.

[20] William H. Bristow, "Communication in Curriculum," Educational Leadership, November, 1965, p. 143.

[21] M. J. Smith and J. M. Burk, "Communication is Central to Effectiveness," Pennsylvania School Journal, April 1968, p. 9.

Bunker feels that the face-to-face encounter is at the core of communication and that the communication process may be fully understood and influenced only by taking into account the organic interrelationships of a continuing organization.[22]

Meetings are occasions for this face-to-face encounter, but too frequently meetings become matters of habit or ritual. Menkin offers criteria for holding a meeting:

- Know why the meeting is being held (objective or purpose).
- Know what content and format will best achieve this purpose.
- Ask if a meeting is the best way to fulfill this purpose.[23]

The administrative structure of the organization might hinder communication. Henderson observes that the deterioration of communication frequently results from an inadequate use of the group process. The administrative structure becomes more complex. The teachers are overlooked in consultations about policies and decisions; they are often given information and directives about decisions that have already been made. Henderson points out that the causes of these subtle changes are not too difficult to discern. One basic problem is the lack of efficiency. Efficiency requires more line officers, which requires the development of procedures for action and for control. The complexity that naturally develops with size and the accompanying diversity of problems tends to necessitate staffing sufficiently to permit adequate delegation of responsibilities. These would naturally center around specific functions. The net effect this would have would be a vertical structuring of the administrative pyramid. A second cause offered for the deterioration is the tremendous increase of feedback from institutions, legislators, state agencies, and parents.[24]

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[22] D. R. Bunker, "Communicating Person to Person," National Elementary Principal, May 1962, p. 20.

[23] P. Menkin, op. cit., p. 47.

Rogers speaks of the roles corresponding roughly to the stages of the individual innovation decision process:

- Stimulation or awareness by someone that a need for an innovation exists. The stimulation is often outside the system.
- Invitation or promotion of the introduction of the new idea into the social system, usually by a small number of individuals who are very much oriented to change and who may include the original stimulation.
- Legitimation or decision to adopt or reject the innovation by those in power.
- Execution or putting the decision into action. This activity is often delegated by the legitimizers to persons of lower status or less power.[25]

SUMMARY

Every existing institution needs a constant infusion of innovations in order to aid constructive change, adaptability and self-renewal. Innovations must be communicated via certain channels to members of a social system who adopts it over a period of time. Personality, social and economic status of the adopter, lines of communication, and the innovation itself affect the acceptance or rejection of the innovation. The five necessary characteristics for the successfull adoption of an innovation are relative advantage, compatability, divisibility, complexity, and communicability. The past experiences of the potential user plays an important part in the acceptance of any innovation.

Decision making can be viewed as the action or actions performed by the individual in making a deliberate choice. Four types of decisions are optional decisions, contingent decisions, collective decisions, and authority decisions. Decision making and the administrative process are inseparably linked. Who makes the decisions as well as who should make the decisions are questions that require answers in the near future. Until these questions are answered, curriculum planning in America will be less effective than it should be. Increasing specialization and the complex and specialized background required for curriculum decision making are causing educational conflicts. The roles of the specialist and the generalist in decision making need to be more clearly defined. Other complicating factors are coordination, communication, accountability, and interunit conflict. Add to this the problem of the over-burdened decision maker and the situation becomes even more complex.

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[24] A. D. Henderson, "Desired Influence: Improving Communication Between Administration and Faculty," Journal of Higher Education, June 1967, p. 311.

[25] E. M. Rogers, op. cit., p. 74.

Communication remains a severe problem in a modern technological society. The experimental background, present situation, needs, and drives color the meanings of words. Research has played too little a part in decision making and communication. Communication is a professional responsibility of the school administrator. Face-to-face encounter is at the core of communication. The administrative structure of the organization may hinder communication. The inadequate use of the group process may result from complicated administrative structures. The size of the institution and diversity of problems add to the complexity of administrative structure in complicating effective communication.

The roles corresponding roughly to the stages of the individual innovation decision process are stimulation, initiation, and legitimation or decision to adopt and execution.

It can be readily recognized that any innovation in curriculum must heed strictly the demands and expectations to be made upon it by the nature of the innovation, the innovative process, the decision-making process, and the dynamics of communication.

Chapter III

THE PROCEDURE

The research project reported in this study was conducted in six phases. Phase I dealt with identifying the participants to be utilized in the study and soliciting their cooperation. Phase II included the development and testing of the instrument utilized in this study. In Phase III, the chief school administrators and key school personnel involved in the decision to accept or reject the PRIMES project were interviewed. Phase IV involved gathering such data as district size, administrative responsibilities of the chief school administrator, and educational background of the chief administrator. Phase V treated the analysis of the data gathered in the study. Phase VI dealt with the treatment of the data, the summary, the conclusions drawn from the study, the preparation and distribution of the final reports.

PHASE I--SELECTION OF POPULATION

The population used in this study, drawn from the school districts in the southeastern Pennsylvania Counties of Chester, Delaware, and Montgomery, includes all the districts to which PRIMES was offered. Appendix A is a complete listing of the schools involved in this study.

PHASE II--DEVELOPMENT OF THE INSTRUMENT

The data for this study was obtained in a personal interview with each of the chief school administrators involved in the study. The interviewer asked questions contained in a questionnaire designed to discover why PRIMES was accepted or rejected. The questions, as well as the motivation for each, will now be considered in depth. The complete questionnaire is reproduced in Appendix B .

Knowledge and Perception of PRIMES

To be sure, no one can make a decision unless he has sufficient information. This part of the questionnaire attempts to learn if the potential user of PRIMES sufficiently understood--either as a result of written communications or meetings--the significant facets of the project. To discover this, the following questions were asked.

- Are you familiar with the PRIMES project?
- How do you view PRIMES; what services do you feel can offer your district?
- What impressed you most about PRIMES?
- What do you consider the most valuable thing PRIMES can offer your district?

Since the relative advantage of an innovative project must be appreciated by the potential receiver, the following question was asked.

- Do you think that the PRIMES personnel have anything to offer beyond that which your district currently has?

Communication

Another factor researched was the amount and kinds of communication each of the participating districts had with the PRIMES personnel either through written or aural communication. This topic could be researched by determining which of the informative pieces of literature sent by PRIMES were received, which of these were still on hand, and which of the informative conferences and workshops were attended by district personnel. To research this aspect, the following questions were asked.

- Who within your district was your first major source of information about PRIMES ?
- Which conferences have your personnel attended?
- What PRIMES publications or notifications have you received?
- What materials do you have on hand?

On many occasions the reader misinterpets the meaning and intent of the writer. Therefore, it is important to obtain a reaction to the written communication. The following questions were designed to research this area.

- What were the weak points of the written information received?
- What do you view as the strongest aspects (in an information sense) of the written material received about PRIMES?

It is also important to determine the reaction of the participants of the various informative conferences held for the purpose of interesting potential users of the system; the question which follows was designed to research how well the conferences imparted information.

- How did you react to the oral presentation?

Administrative Aspects

In view of the fact that the administrative structure is such a determining factor in influencing the communication process as well as the decision-making process, the following question was included in the study.

- Which curriculum personnel does your district employ?

Imbedded in the administrative structure are the communication lines essential to acceptance or rejection of any new idea. It was important, therefore, to determine the manner in which communication is disseminated within a given school district.

- To whom is curriculum mail sent?
- To whom may mail be rerouted ?

The following questions were included for two reasons: to determine whether or not the recipients had properly understood that the PRIMES services were being offered free and to determine the hidden cost factors that immediately occur to a chief school administrator when he thinks of curriculum development.

- Do you feel that involvement with PRIMES would place a financial burden on your district?
- What do you see as the greatest expenses involved in PRIMES?

In the final analysis, the acceptance or rejection of the innovative curriculum project must rest with a decision made by a school administrator or agency. The key questions involved seem to be who makes the decision, in what manner the decision was made, and why the decision was reached. The following questions endeavor to find answers to these queries.

- Who would make the decision to become involved in PRIMES?
- How was the final decision reached?
- Why did you choose (or not choose) to become involved with PRIMES?

A factor which affects the acceptance of any innovation and has a direct effect on decision making is the envisioned weakness seen by the potential recipient. For that reason the following question was included.

- What do you think are the weaknesses of the PRIMES project?

Another factor which would influence a decision to become involved in a curriculum project is the degree to which the potential user is already engaged in curriculum work. For this reason the following question seemed germane.

- What elementary-curriculum projects were your district engaged in when you first heard about PRIMES?

Follow-up Study

In developing the questionnaire, it appeared to the developer that a unique opportunity was being presented. The question arose as to whether or not a face-to-face confrontation and information session following the research interview would yield any significant change in attitude toward the project. To implement this, the interviewer followed the questionnaire with an update of PRIMES offerings and reactions to the following questions were then obtained.

- In view of what you now know about what the project offers, do you feel that PRIMES can offer your district assistance?
- Are you now interested in becoming involved with PRIMES?
- Who could be designated as your district's contact with PRIMES?
- What could PRIMES do to offer more to your district?

PHASE III--INTERVIEWS

The interviews were conducted by the researcher face to face with each of the participants in his own individual school district. Although a half hour was budgeted for the interview and the major portion of data was gathered in the first twenty minutes, most interviews far exceeded the half-hour allotment due to the high degree of interest generated by the review of the offerings of the PRIMES project. It must be mentioned here, however, that none of the chief school administrators had attended the PRIMES conferences themselves and some seemed upset that a project that seemed to offer such promise was refused by their representatives. Analysis of the data concerning change in attitude toward the project, the percentage of districts now wishing to gain further information about the project, as well as the significant number of districts wishing to become involved in the project, yielded surprising results. It seems particularly pertinent to point out that there was an exceptional degree of cooperation in this study; it became obvious during the interviews that there was a high degree of curriculum expertise that might be tapped with a much higher projection for success if better techniques for dissemination of curriculum innovations were developed.

PHASE IV--ANALYSIS OF DATA

The four major aspects of the study--communication, administrative aspects, perception and knowledge of PRIMES project, and follow-up--were divided into the various factors that seemed to be particularly the domain of that specific area. Communication included source of information about the project, conferences attended, notifications and publications received, viewed strengths and weaknesses of written communication, and reactions to the conferences. The administrative aspects of the study included listing of curriculum personnel; curriculum-mail dissemination practices; viewed cost factors of curriculum work such as potential expenses; per-pupil expenditure; and economic level of community; educational level of the superintendent; size of the district; the district's curriculum decision-making responsibility; how the decision to accept or reject the project was made; reasons given for the acceptance or rejection of the project, and the number and kinds of curriculum projects already engaged in. The perception-and-knowledge aspect of the PRIMES project included such factors as degree of familiarity with the PRIMES project, impression made by the project, aspect of the project considered as valuable, and the relative advantage of PRIMES offerings. The follow-up activities included an analysis of change in attitude toward the project in terms of further acceptance or rejection of the project. The data yielded by the instrument was analyzed using percentages as well as the following statistical tests:

Point-Biserial Correlation

$$r_{pbi} = \frac{(M_p - M_t)}{\sigma t} \sqrt{\frac{N_p}{N_q}}$$

Chi-Square

$$X^2 = \sum \left[\frac{(F_o - F_e)^2}{F_e} \right]$$

PHASE V--ANALYSES OF THE DECISION-MAKING PROCESS

The fifth phase of the project included the utilization of the data in an attempt to determine those factors which seemed to be most closely related to the acceptance or rejection of the project with the hope that they might provide some direction toward more effective initiation of curriculum innovation. Analysis of those factors most closely related to the acceptance or rejection of the PRIMES project should point to the areas of communication, administrative structure, and decision making that need further study.

PHASE VI--FINAL REPORT

The final report will be distributed to the participating school districts; hopefully the report will provide direction for evaluation or re-evaluation of communication practices, curriculum decision-making procedures, and administrative structure. It will also be disseminated through the various curriculum-development channels to become a part of that ever-growing body of research that might some day provide more direction to this most important area of the school program.

Chapter IV

ANALYSIS OF DATA

The findings in this chapter deal with the five major areas of concern in the study and the subhypotheses of each of these areas. The first set of subhypotheses treats the communication aspect of the study. The various factors of communication investigated in this study are:

- Dissemination of curriculum mail
- Exposure to PRIMES materials
- First major source of information about the PRIMES project
- Effectiveness of PRIMES publications

  --Which were received

  --Which were retained by school districts

  --Perceived weaknesses

  --Perceived strengths
- Effectiveness of PRIMES conference information

  --Conferences attended

  --Reaction to conferences

The second section of this chapter treats the degree of knowledge gained about the PRIMES project and an analysis of the information which indicated the school administration's perception of the project. The factors studied under this area include:

- Familiarity with the project

- Perception of the project and its offerings
  - --Impression of project offerings
  - --Offerings considered most valuable
  - --Project offerings considered beyond that which the district itself could develop

The work conducted in the perception of the project attempted to show how well the school administrator understood each of the offerings of the PRIMES project. Before he could be impressed by an offering, consider it valuable, or consider it to be something which his district itself could not develop, he would have to have a substantial understanding of the offering. If an administrator could describe a specific offering of the PRIMES project and cite its relative advantage, then he obviously understood this particular element of the project. The analysis of this phase of the project was twofold--the degree of appreciation of the offerings of the project, and the understanding of each by the respondent.

The third section of this chapter includes the analysis of the data concerning specific aspects of the administrative structure of the school districts to which the PRIMES project was offered. The elements studied in this phase include:

- Administrative structure in relation to the curriculum personnel employed by the district
- The real and perceived financial considerations of the project both
  - --Per-pupil expenditure for each district and its relation as a possible factor in the acceptance or rejection of the project.
  - --The possible relation of the percentage of pupils from families below the poverty level to the acceptance or rejection of the PRIMES project.
  - --Whether or not the project was perceived as one which place a financial burden upon the district and the degree to which this perceived burden might affect the acceptance or rejection of the project.
- The possible relation of the educational level of the superintendent to the acceptance or rejection of the project.

- Analysis of the decision making process

  --Who was the status leader responsible for making the decision?

  --How was the decision reached?

  --Reasons given for acceptance or rejection of the project (including perceived weakness of the project).

- Degree of engagement in other curriculum projects at the time PRIMES was offered and its possible relation to the acceptance or rejection of the project.

The fourth section of this chapter deals with the areas of a possible change in attitude toward the project and the possible change of decision from an original rejection to an acceptance of the PRIMES project and a willingness to cooperate in curriculum development. This includes the designation of a specific individual to work with the project. This section of the study considered analysis of the data obtained after a reiteration of what the PRIMES project is and specifically what it offers to a school district. It contains perhaps the most meaningful aspect of the data gathered by this study and seems to offer direction to dissemination techniques utilized in offerings of curriculum innovation to school districts.

The fifth and final consideration of this chapter deals with the suggestions offered by the chief school administrators involved in this study. It is particularly pertinent since it includes the positive directives offered by some of the most talented men in public education--men who by their education, position, and experience have much to offer the innovator. Their opinions must be considered if the innovator is to successfully implement his curriculum developments in public school institutions.

COMMUNICATION

Dissemination of Curriculum Mail

The first of the communication factors studied was the dissemination practices used by the school districts involved in the study population. Two subtopics were investigated. The first attempted to determine:

- Where curriculum mail from state department, curriculum agencies, book companies, for example, is sent.

This question attempted to determine the individuals who were the major recipients of mail which deals with curriculum, and to isolate the initial depositories for curriculum mail which would of course include any mail dealing with curriculum innovation. The following statements reflect the data gathered by the questionnaire.

Eighty-six percent of the schools which elected to use the PRIMES project designated the superintendent as the major recipient of curriculum mail, while ninety percent of the school districts which did not choose to join the PRIMES project also pointed to the superintendent's office as a major depository for curriculum mail.

In districts which have no superintendent, fourteen percent of the schools involved in the PRIMES project designated the supervising principal as the major recipient of curriculum mail.

The curriculum supervisor was termed a major recipient of curriculum mail by seventy-one percent of the schools in the PRIMES project while, sixty-four percent of the schools which rejected the PRIMES project designated the curriculum supervisor as a major recipient.

None of the schools which elected PRIMES pointed to the mathematics supervisor as a major recipient of curriculum mail, although twenty-two percent of the schools which did not elect PRIMES felt that the mathematics supervisor was a major recipient of curriculum mail.

Forty-three percent of the schools in the PRIMES project noted that principals were major recipients of curriculum mail while eight percent of the school districts not engaged in the PRIMES project felt that the principal was a major source of curriculum mail; but forty-eight percent of those schools remarked that principals receive curriculum mail also although they might not be called major recipients.

Twenty-nine percent of the districts in the PRIMES project designated the mathematics-department chairman as a minor recipient of curriculum mail; twenty-two percent of the districts not in PRIMES pointed to the mathematics-department chairman as a minor source, and two percent of this group said he was a major source.

In the districts that did not elect to join PRIMES, the following individuals were also felt to be recipients of curriculum mail: elementary-mathematics coordinator, two percent; mathematics committee, four percent; supervising principal, two percent; elementary supervisor, six percent; teachers, two percent.

Table I summarizes the major recipients of curriculum mail.

The second question deals with the direction taken in the rerouting of curriculum mail. It attempted to determine to whom the material was directed after it was sent, for example, to the superintendent or assistant superintendent.

The primary recipient of the rerouted curriculum mail in the participating PRIMES districts was the assistant superintendent for curriculum; eighty-six percent of the districts reroute the mail to this individual. Within the districts which rejected the project, the assistant superintendent was the recipient of the rerouted curriculum mail in sixty-eight percent of the cases.

The principal received the rerouted curriculum mail in fifty-seven percent of the PRIMES project districts while the principal was the designated recipient of rerouted curriculum mail in sixty-four percent of the nonparticipating districts.

In fourteen percent of the PRIMES participating districts the K-12 mathematics coordinator received the rerouted curriculum mail; in the nonparticipating districts, the mathematics coordinator received the rerouted curriculum mail in thirty-two percent of the cases.

The elementary-school mathematics supervisor had the rerouted curriculum mail sent to him in twenty-nine percent of the districts involved in the PRIMES project while the elementary-school mathematics supervisor received the rerouted curriculum mail in ten percent of the nonparticipating districts.

Other individuals receiving rerouted curriculum mail in the nonparticipating districts were: teachers, four percent; elementary supervisors, two percent; curriculum supervisors, two percent; curriculum administration council, two percent.

Table II summarizes the data presented in the foregoing discussion.

TABLE I

INDIVIDUALS DESIGNATED AS MAJOR RECIPIENTS OF CURRICULUM MAIL

School Districts In PRIMES			School Districts Not In PRIMES	
Number	Percent	Designated Individual	Number	Percent
6	86	Superintendent	45	90
5	71	Curriculum Supervisor (Assistant Superintendent)	32	64
0	0	Mathematics Supervisor	11	22
3	43	Principals (Major)	4	8
		(Minor)	24	48
2	29	Mathematics Department Chairman (Major)	1	2
		(Minor)	11	22
		OTHER RECIPIENTS		
		Elementary Mathematics Coordinator	2	4
		Supervising Principal	1	2
		Elementary Supervisor	3	6
		Teachers	1	2
N=7			N=50	

TABLE II

RECIPIENTS OF REROUTED CURRICULUM MAIL

School Districts In PRIMES			School Districts Not In PRIMES	
Number	Percent	Designated Individual	Number	Percent
6	86	Assistant Superintendent for Curriculum	34	68
1	14	Mathematics Supervisor	16	32
4	57	Principals	32	64
2	29	Elementary-Mathematics Supervisor (Coordinator)	6	12
		OTHER RECIPIENTS		
		Elementary Supervisor	1	2
		Teachers	2	4
		Curriculum Supervisor	1	2
		Elementary-Mathematics Supervisor	1	2
		Curriculum Administrative Council	1	2
N=7			N=50	

Only one school district in the nonparticipating group of schools uses a mail-routing sheet to guarantee proper direction of curriculum mail within this district. A carefully designed routing sheet could effectively disseminate curriculum mail.

Exposure to PRIMES Material

A second factor attempted to determine the number of exposures that the school districts had to PRIMES communication materials or conferences such as: state department mail, letters, brochures, convention presentations, steering committee meetings, county presentations, local presentations, and filmstrips. The number of exposures was quantified for each district in the participating and nonparticipating districts. A point-biserial mode of analysis of the data was done to determine the validity of the null hypothesis that there is no significant relation between the number of exposures a district has to PRIMES project materials or conferences and whether the school district accepted or rejected the project.

The point-biserial correlation yielded an r_{pbi} of .513 which was significant at the .05 level. The null hypothesis can be safely rejected and it can be assumed that there was a significant relation between the number of exposures to PRIMES project materials or conferences and the acceptance or rejection of the project. The districts which accepted PRIMES tended to have had a greater number of exposures to PRIMES communications. The data to support the correlation above is supplied in Table III.

TABLE III

NUMBER OF EXPOSURES TO PRIMES PROJECT MATERIALS AND/OR CONFERENCES AND ACCEPTANCE OF PRIMES PROJECT

	IN	OUT
0	0	7
1	0	7
2	0	10
3	0	14
4	2	9
5	3	1
6	1	2
7	1	0

$$r_{pbi} = \frac{(M_p - M_t)}{\sigma t} \sqrt{\frac{N_p}{N_q}}$$

$$r_{pbi} = \frac{(5.14 - 2.77)}{1.72} \sqrt{\frac{7}{50}}$$

$$r_{pbi} = .515$$

Significant at .05 Level

First Personal Source of PRIMES Information

The study also sought to determine which person within a district was the first to know about the PRIMES project. The assistant superintendent for curriculum was the first source of information about PRIMES in fifty-seven percent of the school districts which elected PRIMES while the same individual was the first personal source of information in ten percent of the districts that did not elect the PRIMES project.

The mathematics supervisor was the first personal source of information about PRIMES in fourteen percent of the districts in the PRIMES project while this individual was cited as the first personal source of information in eight percent of the nonparticipating districts.

The elementary-mathematics supervisor was the first personal source of information about PRIMES in approximately ten percent of the nonparticipating districts.

The mathematics-department chairman at the high school level was the first source in two percent of the nonparticipating districts.

The elementary-school principal was the first personal source of information about the PRIMES project in forty-three percent of the participating districts while the same individual was designated as the first source in ten percent of the school districts that did not elect to participate in PRIMES.

Individual teachers were designated as the first source of information in six percent of the nonparticipating districts. Thirty-four percent of the superintendents in the same group felt that they were the first source of information about the project because of literature mailed to them.

The percent total for the group of school districts which accepted the PRIMES project exceeded one hundred percent because one district had two different individuals designated as first major source of information about the project. Both individuals attended a PRIMES conference together. It is also significant to note that all of the school districts which elected to participate in PRIMES had individuals other than the school superintendent who was a source of information about the project while only fifty-two percent of the nonparticipating districts had a personal source of information about the project.

Table IV summarizes the foregoing discussion.

TABLE IV

FIRST PERSON TO KNOW ABOUT THE PRIMES PROJECT

School Districts In PRIMES			School Districts Not In PRIMES	
Number	Percent	Source	Number	Percent
4	57	Assistant Superintendent for Curriculum	6	10.2
1	14	Mathematics Supervisor (K-12)	4	8
		Elementary-Mathematics Supervisor	7	10.4
		Mathematics-Department Chairman	1	2
3	43	Principal	5	10
		Teachers	3	6
		Superintendent (Through Mail Sources)	17	34
N=7			N =50	

Effectiveness of PRIMES Publications

The study also investigated the number and kinds of PRIMES publications received by the school districts involved in this study.

The first task in the investigation of PRIMES publications was to determine the relation between the number of publications received by the participating districts and their willingness to participate in the PRIMES project. The following null hypothesis was tested: there is no significant relation between the number of publications received by the school districts from the PRIMES project centers and whether or not the school district accepted the project.

A point-biserial correlation analysis of data yielded an r_{pbi} score of .333 which was significant at the .05 level of confidence. This was sufficient to reject the null hypothesis. It would seem to indicate that there was a significant relation between the number of publications received by the school districts and the acceptance of the PRIMES project.

The data for the above correlation is supplied in Table V.

TABLE V

NUMBER OF PUBLICATIONS RECEIVED FROM PRIMES CENTERS AND ACCEPTANCE OF PRIMES PROJECT

	IN	OUT
0	0	9
1	0	3
2	0	13
3	0	13
4	7	12

$$r_{pbi} = \frac{(M_p - M_t)}{\sigma_t} \sqrt{\frac{N_p}{N_q}}$$

$$r_{pbi} = \frac{4 - 2.53}{1.65} \sqrt{\frac{7}{50}}$$

$$r_{pbi} = .333$$

Significant at the .05 Level of Confidence

Whether or not the district felt the materials they were sent about the PRIMES project were significant enough to be retained within the school district could indicate the acceptance of the written PRIMES information. A portion of the questionnaire was designed to determine which of the specific materials were retained.

The information letters describing the project and its extent were retained by one hundred percent of the districts which accepted the PRIMES project while only forty percent of the districts which rejected the project retained this material.

One hundred percent of the districts which accepted the project retained the descriptive brochure sent to all the school districts which cooperated in the study. This illustrated brochure described the project and each of its services. Of the districts which rejected the project, only fifty percent retained the brochure. Samples of the letter and brochure sent to all the school districts in Montgomery, Chester, and Delaware Counties may be found in Appendix C.

A conjecture that the retention of the PRIMES information materials would indicate an interest in the project and a possibility of acceptance led to the following null hypothesis: there is no significant difference between the number of pieces of informative materials retained by group of school districts which accepted the PRIMES project and the number of pieces retained by the group which rejected the project.

A chi-square score of 5.016 was significant at the .05 level of confidence; this was sufficient to reject the null hypothesis. It was therefore assumed that the group of school districts which retained a significantly high number of the informative materials sent them introducing the PRIMES project also tended to accept the project. Table XXVI Appendix D supplies the data relevant to this work.

To determine the perceived strengths and weaknesses of the informative materials sent to each district, each district was asked to list the weaknesses found in these materials. Included in the questionnaire were queries with alternatives such as "not clear enough," "too technical," and "not inclusive enough." To determine whether the perceived weaknesses of the written materials were a factor in their acceptance, the following null hypotheses was developed: there is no significant difference in the number of weak points listed for the written PRIMES materials either by the group which accepted the PRIMES project or by the group which rejected it.

The chi square of 0.033 was not significant at the .05 level of confidence. The null hypothesis is, therefore, accepted. The stated weaknesses about the written materials apparently did not influence the decision to accept the PRIMES project since the districts which accepted the project were equally critical of the written material.

Table VI lists the major weaknesses of the written materials supplied to each of the districts for the purpose of introducing the PRIMES project and its services. The percentages listed for each point represent the percent of the total number of listed weaknesses by both groups.

TABLE VI

WEAKNESSES ATTRIBUTED TO THE WRITTEN INFORMATION SENT TO INTRODUCE THE PRIMES PROJECT

	Number	Percent
Not clear	16	35
Too much to read	13	28
Too technical	7	15
Not sure what was offered	5	11
Not inclusive enough	2	4
Not enough personal contact	2	4
No organization	1	2
Total Responses	46	

A two-part question was included to ascertain the strengths of the written informative materials and to determine whether or not an understanding of the specific curriculum offerings that PRIMES presented would affect the acceptance or rejection of the project. The first part solicited noted strengths of the written information while the second part asked which offerings were particularly acceptable to the school districts. Table VII shows the stated strengths of the written materials sent to the districts involved in the study. The statements about the worth of the data bank and the thoroughness of the program do not reflect the specific offerings of the project.

TABLE VII

STATED STRENGTHS OF THE WRITTEN INFORMATIVE MATERIALS

School Districts In PRIMES			School Districts Not In PRIMES	
Number	Percent	Strengths	Number	Percent
7	41	Content Description	4	13
0	--	Text Selection	4	13
1	6	Testing Information	2	7
4	24	Behavioral Objectives	2	7
3	18	Consultant Help	6	20
2	12	Curriculum Guide	3	110
0	--	Text Selection	4	13
0	--	Data Bank	3	10
		Thoroughness of Project	2	7
17 Total		Total	30	

Even though only seven schools in the group accepted PRIMES, they accounted for more than half the number of identified specific offerings of the program. This indicates a significant amount of information gained from the written materials sent to them and precipitates the following null hypothesis: there is no significant difference in the number of specific offerings identified as strengths between the group of school districts which elected the PRIMES project and the group which rejected it. The chi-square score of 8.867 was significant at the .01 level of confidence and exceeded the .05 level, thereby rejecting the null hypothesis. The group of school districts which elected to enter the PRIMES project identified a significantly greater number of project offerings than the group which rejected it.

Effectiveness of PRIMES Conferences

During the project's introductory stages, the PRIMES project personnel held several conferences to introduce the program and its services to school district administrative officers. Conferences were held at Pittsburgh, California (Pennsylvania), West Chester, Allenberry, Carlisle, and in the local counties. The following null hypothesis attempts to investigate the potential relationship of number of conferences attended and acceptance of the project: there is no significant difference between the number of conferences attended and the acceptance of the PRIMES project by a group of public school districts. The chi-square score of 5.398 yielded by the conference data was significant at the .05 level of confidence. This indicates that there was a significant relation between the number of PRIMES conferences attended by representatives of a school district and their acceptance of the project. The data for the above analysis is shown on Table VIII.

TABLE VIII

CONFERENCE ATTENDANCE

School Districts In PRIMES Number	Conferences	School Districts Not In PRIMES Number
1	Pittsburgh	4
2	West Chester	23
7	County	2
	Allenberry	1
	Carlisle	1
	California (Pennsylvania)	1
10 Total		Total 31

A second factor investigated with respect to the conferences was the reaction of the school administrators to the oral presentation of the PRIMES personnel. The positive reactions were investigated to determine which of the presentations seemed most effective and which PRIMES offerings were best received. The investigation of the negative reactions entailed such factors as clarity, irrelevancy, and potential costs. Whether or not the negative or positive attitudes would have an effect on the acceptance of the project was a concern that prompted the following null hypothesis: there is no significant difference in the direction of the attitude (positive or negative) between the group of schools which accepted the PRIMES project and those which rejected it.

The chi-square score of .0934 yielded by the attitude toward the conference data was not significant at the .05 level of confidence; therefore, the null hypothesis was rejected. Apparently there was no significant difference between the direction of the attitude including the supporting reasons and the acceptance or rejection of the project. Data supporting this finding is found in Table IX.

Table IX illustrates that the reasons given for the positive attitude were somewhat similar for both groups. The information can be used by the PRIMES directors as an indicator of direction of interest. It certainly will be of service in the future. Attention must be given to any potential offerings not included in this list, but which are deemed important by the directors since they are not given specific attention by the conferees. The negative criticism offers direction for future conferences by pointing to specific areas which need attention.

FAMILIARITY WITH THE PROJECT

Acceptance of an innovative curriculum project requires that the receiving school district administrators clearly understand the project, what its specific offerings are, and the relative advantage of these offerings. The school administrator's familiarity with an innovation's specific services should therefore be a determining factor in an initial acceptance or rejection of an innovative curriculum project. With this in mind, the study attempted to determine how well the school administrators which accepted the project felt that they understood the project and its offerings, and how well those school administrators which rejected the project felt that they understood the project. First, the school administrators were asked whether they

TABLE IX

ANALYSIS OF REACTION TO CONFERENCE DATA

School Districts In PRIMES Number	Reaction	School Districts Not In PRIMES Number
	Positive (Why?)	
5	Curriculum Description	8
4	Curriculum Help	6
2	Materials	6
2	Experts	4
1	Mathematics Background	
	No Reason for Attitude Given	2
14 Total		Total 26
	Negative (Why?)	
1	Not Clear	4
	Did Not Seem To Offer Much	6
	Could Not See Its Application In Your District	6
	Seemed Too Costly	
1	Seemed to Require Too Much Expertise	2
	Superior Attitude of Presenters	2
2 Total		Total 20

were or were not familiar with the project and its offerings. An alternative to a direct "yes" or "no" was offered by allowing the response of "vaguely." The null hypothesis researched was as follows: there is no significant difference in the response given to a query attempting to determine the degree of familiarity with the PRIMES project between those school district administrators which accepted the project and those which rejected it.

The chi-square score of 14.763 yielded by the data gathered was significant at the .001 level which is beyond the .05 level of confidence desired. The null hypothesis was therefore rejected. There was a strong relationship between the degree of familiarity that school district administrators had with the project and their acceptance of the project. Data supporting the above information is supplied in Table X.

TABLE X

ANALYSIS OF DATA YIELDED BY INVESTIGATION OF DEGREE OF FAMILIARITY WITH PRIMES PROJECT

School Districts In PRIMES		School Districts Not In PRIMES
Number	Familiar with PRIMES	Number
7	Yes	13
0	No	16
0	Vaguely	21
N=7		N=50
	Chi square 14.763	
	Significant at .001 level of confidence	

Perception of the Project

The second factor investigated in this section of the study evaluated how well the school administrator understood the specific offerings of the PRIMES project. This was done in three distinct areas--perception of the project and its offerings, impressions school administrators had of these end products, and which of these the school administrators felt were of greatest significance.

To determine the manner in which PRIMES was perceived by the school administrators to whom the project was offered, the study evaluated the administrator's ability to name a specific service and describe the inherent nature of the service. The administrators could discuss the entire range of services offered by the project.

Theoretically, the greater the understanding of the specific services and the greater the number of services understood, the greater would be the inclination to accept the project. This prompted the following null hypothesis: there is no significant difference in the number of PRIMES services understood by the school district administrators which accepted the PRIMES project and those which rejected it.

The chi-square score of 6.693 yielded by analysis of the data was significant at the .01 level of confidence which was beyond the .05 level set for acceptance; therefore, the null hypothesis was rejected. It is therefore assumed that the school district administrators which accepted the project understood a greater number of services of the PRIMES project. Data to support this analysis is supplied in Table XI.

TABLE XI

PRIMES SERVICES UNDERSTOOD AND ACCEPTANCE OF THE PROJECT

School Districts In PRIMES Number	Services Understood	School Districts Not In PRIMES Number
0	Know very little about PRIMES	25
5	Curriculum Description	2
5	Textbook Analysis	15
3	Textbook Selection	16
5	Scope and Sequence	2
3	Content Outline	2
2	Behavioral Objectives	4
23 Total		Total 41

Chi square 6.693

Significant at .01 level of confidence

A distinct advantage of this information to the directors of PRIMES was an analysis of the offerings best understood. For example, the group which rejected the project understood best the textbook-analysis and textbook-selection services. Further, school districts which were not interested in these specific services would probably see little value in accepting the project. Obviously, the group which accepted the project understood more of the specific services which the project offered.

The study further examined the specific supportive aspects of the project which seemed to most impress the school administrators. Not only was the school administrator asked to state the specific element which impressed him most, but also to indicate why this specific aspect of the project impressed him. Those school administrators which would be impressed the most--as evidenced by the number of the project's elements with which they were impressed--should elect to participate in the project. The following null hypothesis was therefore projected: there is no significant difference between the number of aspects of the PRIMES project which impressed the school administrators who elected to join the PRIMES project and those who rejected it.

The chi-square score of 12.695 yielded by the analysis of the data was significant at the .001 level which was beyond the .05 level of confidence set for acceptance. The null hypothesis was therefore rejected and it was assumed that the school administrators which accepted the PRIMES project were impressed with a greater number of the services offered by the PRIMES project than those who rejected it. Data to support the work above is shown in Table XII.

TABLE XII

PRIMES ASPECT WHICH IMPRESSED THE SCHOOL DISTRICT ADMINISTRATORS

School Districts In PRIMES		School Districts Not In PRIMES
Number	Supportive Aspect of Project	Number
5	Services	3
2	Personnel	1
5	Content Listing	4
3	Behavioral Objectives	3
5	Curriculum Description	7
20 Total		Total 18
	Chi square 12.675	
	Significant at .001 level of confidence	

The study attempted to distinguish those services which impressed the school administrators and those which they felt were valuable. The motivation behind this distinction was simply that an innovation may be impressive, yet the potential users may not see it as particularly valuable. Here again the school administrator had to verify his selection of valuable service by supportive reasons. The range of services allowed a number of different alternatives for answers. The number of services deemed valuable was quantified and the data was analyzed to investigate the following null hypothesis: there is no significant difference between the number of services deemed valuable by the school administrators which elected to join the PRIMES project and those which rejected it.

The chi-square score of 10.214 yielded by analysis of the data was significant at the .01 level and this was beyond the .05 level of confidence set for acceptance. The null hypothesis was rejected and it was assumed that the school administrators which accepted the PRIMES project saw a greater number of services as valuable than those who rejected it. Data to support the work shown above is given in Table XIII.

TABLE XIII

PRIMES SERVICES DEEMED VALUABLE BY
SCHOOL DISTRICT ADMINISTRATORS

School Districts In PRIMES Number	Services	School Districts Not In PRIMES Number
6	Experts	5
4	Consultants	6
5	Content Outline	5
4	Behavioral Objectives	4
1	Text Analysis	4
20 Total		Total 24

Chi square 10.214

Significant at .01 level of confidence

The study next considered the relative advantage of the services offered by the PRIMES project over those services already available within the school district. The school administrators were questioned about those aspects of PRIMES which offered advantages such as personnel, services, and materials in excess of the facilities of the individual school district. Relative advantage is frequently given as a valid criteria for the selection of an innovative project. If the school administrators could give reasons to support their statements of that a service had a specific advantage, and these services of the project could be quantified, then the possible relation between perceived relative advantage and project selection could be investigated. The study sought to determine the number of services which were thought to have relative advantage and the possible relation of this to acceptance or rejection of the project by investigating the following null hypothesis: there is no significant difference between the number of PRIMES services felt to have relative advantage by those school administrators which elected the PRIMES project and those which rejected the project.

The chi-square of 5.804 was significant at the .02 level and this was beyond the .05 level of confidence set for acceptance. The null hypothesis was rejected and it is assumed that the school administrators which accepted the project saw a significantly greater number of relative advantages in the offerings of the PRIMES project than those districts which rejected it. The data to support the work above is shown in Table XIV.

TABLE XIV

PERCEPTION OF RELATIVE ADVANTAGE AS STATED BY SCHOOL DISTRICT ADMINISTRATORS

School Districts In PRIMES Number	Service	School Districts Not In PRIMES Number
6	Experts	14
6	Consultants	19
4	Content Outline	3
2	Behavioral Objectives	4
18 Total		Total 40

Chi-square 5.804

Significant at .01 level of confidence

ADMINISTRATIVE FACTORS

This section discusses the administrative structure of the school districts to whom the PRIMES project was offered. The data analyzed here includes the administration-level curriculum employees, financial considerations of curriculum development related to the PRIMES project, the size of the school districts, analysis of the decision-making process, and involvement in curriculum projects other than PRIMES.

Administrative Curriculum Personnel

First considered are the curriculum personnel employed at the administrative level in each of the school districts for both the group which accepted the PRIMES project and the group of school districts which rejected it.

Seventy-one percent of the school districts which accepted PRIMES employ an assistant superintendent in charge of curriculum while fifty-six percent of the districts which did not elect to join the PRIMES project had this curriculum position in their district. Fourteen percent of the school districts which elected PRIMES and fourteen percent of the districts which did not elect to enter the project had a K-12 mathematics supervisor. One hundred percent of the school districts which elected the PRIMES project had a currently functioning mathematics committee while only four percent of the districts which rejected the project had a mathematics committee. The implication here is obvious.

Since PRIMES is geared to the elementary grades, the two following positions are directly related to the project. Fourteen percent of the school districts which joined the PRIMES project had an elementary-mathematics supervisor and fourteen percent of the districts which did not join the project had this position in their school district. Twenty-nine percent of the school districts which selected PRIMES employed a director of elementary education while ten percent of those districts which rejected PRIMES employed someone in this position.

Interest in the possible relation between the number of curriculum personnel employed and acceptance or rejection of the PRIMES project led to the following null hypothesis: there is no significant difference in the number of curriculum personnel at the administrative level in the group which accepted the PRIMES project and the group which rejected it.

A chi square was run on the data involving the number of administrative-level curriculum personnel and whether or not they elected PRIMES. The score yielded by analysis of the data was 0.934, which was not significant at the .05 level of confidence set for acceptance, and the null hypothesis was accepted. It is therefore assumed that there is no significant difference in the number of administrative-level curriculum personnel and whether or not a school district elected to join the PRIMES project. Table XV summarizes the data discussed above.

TABLE XV

CURRICULUM PERSONNEL EMPLOYED AT THE ADMINISTRATIVE LEVEL AND ACCEPTANCE OF THE PRIMES PROJECT

School Districts In PRIMES			School Districts Not In PRIMES	
Number	Percent	Curriculum Personnel	Number	Percent
5	71	Assistant Superintendent for Curriculum	28	56
1	14	K-12 Mathematics Supervisor	7	14
7	100	Mathematics Committee	2	4
1	14	Elementary-Mathematics Supervisor	7	14
2	29	Director of Elementary Education	5	10
N=7			N=50	

Chi square 0.934

Not significant at .05 level of confidence

As an additional note about district personnel, this study surveyed the educational level of the chief school administrators in the districts discussed. Seventy-one percent of the school districts in the group which elected PRIMES had chief school administrators who held doctorates while sixty-two percent of the school districts which rejected PRIMES had chief school administrators who held doctorates. All other chief school administrators in both groups were at a master's-plus level in educational background.

Financial Considerations

The first financial consideration was the per-pupil expenditure for each district in the study population. Any district giving serious thought to curriculum development must at some phase consider the possible costs involved. One of the financial considerations that was readily available for comparative study was the per-pupil expenditure for the school districts. Possible relationships between the amount of money spent per pupil and the willingness to accept an innovative curriculum project--in this case the PRIMES project--prompted the following null hypothesis: there is no significant difference in the amount of money expended per pupil between the group of school districts which elected to join the PRIMES project and the group of school districts which rejected it.

The point-biserial mode of correlation used to analyze the data yielded an r_{pbi} of ∓.016, which was not significant at the .05 level set for acceptance; therefore, the null hypothesis was accepted. In this case, there is no significant difference in the per-pupil expenditure for the group of school districts which elected to join PRIMES and those which reject the project. Table XVI supplies the data used for this analysis.

Another financial aspect of curriculum development is the current government funding of special programs relating to those districts with a given number of pupils below a standard set as the poverty level. In view of the large number of programs and innovations implemented through federal projects, the possibility that this situation might make a district more receptive to innovation prompted the following null hypothesis: there is no significant difference in the number of pupils below the poverty level in the school districts that elected the PRIMES project and those which rejected it.

The point-biserial correlation score of -.037 was not significant at the .05 level set for acceptance; therefore, the null hypothesis was accepted. It is assumed that there is no significant difference in the number of pupils below the poverty level in the school districts that elected the PRIMES project and those who did not elect to participate in

TABLE XVI

PER-PUPIL EXPENDITURE AND ACCEPTANCE OF THE PRIMES PROJECT

Per-Pupil Expenditure	School Districts Not In PRIMES	School District In PRIMES
$1000	4	1
$ 950	2	0
$ 900	2	0
$ 850	3	0
$ 800	0	0
$ 750	2	0
$ 700	5	1
$ 650	7	2
$ 600	6	1
$ 550	11	2
$ 500	1	0
$ 450	5	0
$ 400	2	0

$$r_{pbi} = \frac{(M_p - M_t)}{\sigma_t} \sqrt{\frac{N_p}{N_q}}$$

$X_p = 3300$

${}_t = 3770$

$X^2{}_t = 21{,}995.0$

${}_t = 22.32$

$M_p = 66$

$M_t = 66.14$

$r_{pbi} = -.016$

the project. Table XVII below supplies the data supporting the findings given above.

TABLE XVII

ANALYSIS OF THE NUMBER OF PUPILS BELOW THE POVERTY LEVEL AND THE ACCEPTANCE OF THE PRIMES PROJECT

% Below OEO Poverty Level	School District Not In PRIMES	School Districts In PRIMES
24% - 25%	0	1
22% - 23%	0	0
20% - 21%	1	0
18% - 19%	0	0
16% - 17%	0	0
14% - 15%	0	0
12% - 13%	0	0
10% - 11%	3	0
8% - 9%	0	0
6% - 7%	9	0
4% - 5%	11	1
2% - 3%	24	4
0% - 1%	2	1

$$r_{pbi} = \frac{(M_p - M_t)}{\sigma_t} \sqrt{\frac{N_p}{N_q}}$$

$X_p = 221$

$X_t = 260.5$

$X^2_t = 2157$

$_t = 4.11$

$M_p = 4.42$

$M_t = 4.57$

$r_{pbi} = -.037$

Next considered was the school administrators' perception of a possible financial outlay for the PRIMES project, and the degree of a financial burden this might place upon the district--great, reasonable, or little. The reactions to these queries were quantified and a chi-square was run on the data to test the following null hypothesis: there is no difference in the number of school administrators who perceived a possible financial burden between the group of school districts which elected the PRIMES project and the group which rejected it.

A chi-square score of 3.391 was not significant at the .05 level of confidence set for acceptance; therefore, the null hypothesis was accepted. It can be assumed that both the group which accepted the PRIMES project and the one which rejected it had similar expectancies for the possible financial burden to be imposed by the project. Data to further support these findings may be found in Table XVIII.

The next null hypothesis tested, which relates directly to the one above, was the following: there is no significant difference in the manner in which the school administrators viewed the degree of financial burden imposed by PRIMES between the group which accepted PRIMES and the group which rejected the project.

The chi-square score of 1.698 yielded through analysis of the data was not significant at the .05 level of confidence set for acceptance. The null hypothesis was therefore accepted and it was assumed that both the group which accepted the project and the one which rejected it viewed the potential financial burden in a similar manner. Table XVIII supplies data to support the analysis given above.

Of course, the PRIMES project was offered to school districts free; the perceived financial burdens in this discussion are not direct cash outlays to participate in the project. Rather, this study investigated "perceived" financial burdens for two reasons. First , a school district could incur administrative expenses by participating in any project: Liason personnel to coordinate local and state agencies cost money; secretarial help to handle the inevitable paper work also represents an expense to a school district. Administrative expenses could conceivably deter a district from participating in a project. But second, if an administrator in reality knew nothing about PRIMES and one of the project's interviewers asked why his district rejected the project, the administrator could save face by stating simply that the project was too costly.

TABLE XVIII

FINANCIAL EXPECTANCIES ANTICIPATED FOR INVOLVEMENT IN THE PRIMES PROJECT

School Districts In PRIMES Number	Expect Financial Burden	School Districts Not In PRIMES Number
5	Yes	21
2	No	12
0	No Response	17
N=7	Degree Expected	N=50
0	Great	5
6	Reasonable	18
0	Little	0

Size of the Districts

District size affects such elements as the number and kinds of administrators needed, administrative structure, and the functioning of curriculum programs. With this in mind, the following null hypothesis was formulated: there is no significant difference in the total number of students attending the schools in the districts which accepted the PRIMES project and in the schools of the districts which rejected it. A r_{pbi} of -.069 yielded by analysis of the data did not reach the .05 level of confidence set for acceptance. Therefore, the null hypothesis was accepted. Data to support the finding is listed in Table XIX.

Since the PRIMES project was geared to the elementary-school level, a point biserial correlation was also run in terms of the number of elementary school pupils attending school involved in this study. The correlation was to test the following null hypothesis: there is no significant difference in the number of elementary-school pupils attending the schools in the districts which accepted PRIMES and in the schools of the districts which rejected it.

The r_{pbi} of .085 was not significant at the .05 level of confidence set for acceptance. Therefore, the null hypothesis was accepted as stated. Apparently there is no significant difference in either the total number of pupils attending school or the number of elementary-school pupils alone for the schools which accepted and the schools which rejected the PRIMES project. Tables XIX and XX supply the data for the finding listed above.

TABLE XIX

NUMBER OF PUPILS IN SCHOOLS WHICH ACCEPTED OR REJECTED THE PRIMES PROJECT

Number of Pupils	School Districts Not In PRIMES	School Districts In PRIMES
15,000	1	0
14,000	0	0
13,000	1	0
12,000	0	0
11,000	3	0
10,000	3	0
9,000	1	1
8,000	4	1
7,000	2	0
6,000	3	0
5,000	8	2
4,000	4	1
3,000	7	2
2,000	6	0
1,000	5	0

$$r_{pbi} = \frac{(M_p - M_t)}{\sigma_t} \sqrt{\frac{N_p}{N_q}}$$

$$r_{pbi} = \frac{(5.16-5.26)}{3.82} \quad (2.$$

$$r_{pbi} = -.069$$

Not significant at .05 level of confidence

TABLE XX

NUMBER OF ELEMENTARY-SCHOOL PUPILS IN DISTRICTS WHICH ACCEPTED OR REJECTED THE PRIMES PROJECT

Number of Elementary School Pupils	School Districts Not In PRIMES	School Districts In PRIMES
8,000	1	0
7,500	1	0
7,000	0	0
6,500	3	0
6,000	1	0
5,500	1	0
5,000	1	1
4,500	2	0
4,000	2	0
3,500	5	0
3,000	4	1
2,500	7	2
2,000	3	0
1,500	8	2
1,000	6	1
500	5	0

$$r_{pbi} = \frac{(M_p - M_t)}{\sigma_t} \sqrt{\frac{N_p}{N_q}}$$

$$r_{pbi} = \frac{(28.4-27.8)}{18.6}(2.67)$$

$$r_{pbi} = .085$$

Not significant at .05 level of confidence

Decision-Making Process

The administrative personnel of each district were asked to name who they thought would make the decision to elect to joing the PRIMES project. Table XXI lists the answers from both the group which accepted the PRIMES project and the group which rejected it.

TABLE XXI

POTENTIAL DECISION MAKERS TO ELECT OR REJECT THE PRIMES PROJECT

School Districts In PRIMES			School Districts Not In PRIMES	
Number	Percent	Decision Maker	Number	Percent
1	14	Superintendent	27	54
1	14	Superintendent and School Board	5	10
3	43	Superintendent and Assistant Superintendent	5	10
1	14	Superintendent, Assistant Superintendent, and School Board	2	4
		Superintendent, Assistant Superintendent, School Board, Mathematics Supervisor, and Principals	1	2
1	14	Superintendent, Assistant Superintendent, Principals, Mathematics Department Chairman	1	2
		Superintendent, Assistant Superintendent, Principals, Administrative Cabinet	1	2
		Superintendent and Administrative Cabinet	1	2
		Superintendent and Principals	2	4
		Superintendent, Assistant Superintendent, Elementary Mathematics Supervisor	1	2
		Superintendent, School Board, Assistant Superintendent, and Administrative Cabinet	1	2
		No Response	3	6
N=7			N=50	

Next, the study determined the manner in which the decision to accept or reject the PRIMES project was actually reached. Table XXII shows the responses given in each case.

TABLE XXII

HOW THE DECISION TO ACCEPT OR REJECT THE PRIMES PROJECT WAS ACTUALLY REACHED

School Districts In PRIMES			School Districts Not In PRIMES	
Number	Percent	Who Decided	Number	Percent
0	0	Not sufficient interest to reach a decision	34	68
		Assistant Superintendent for Curriculum	1	2
3	43	Superintendent	2	4
		Committee	5	10
		Superintendent and Assistant Superintendent for Curriculum	3	6
1	14	Superintendent and Committee	1	2
2	29	Superintendent, Assistant Superintendent for Curriculum and Committee		
1	14	Superintendent and Mathematics Chairman		
		No Response	2	8
N=7			N=50	100 Total

In sixty-eight percent of the cases in which the PRIMES project was rejected, it was rejected by default rather than be a decision. The following examples are some incidents recounted to the interviewers.

The assistant superintendent for curriculum was to call a meeting to investigate the project, but he was in the process of changing jobs and never got around to it. Another superintendent stated that someone reported that the project had something to do with selecting books. We just bought new books so we didn't bother looking any further. In another case, a superintendent became slightly angry and said, "You mean all this was offered to us for nothing and we didn't take it? It looks like I will have to talk to certain people around here."

It is too difficult to determine the amount of misinformation that the superintendents received in terms of what the project was, what it had to offer, what was expected of the participating district, and how much it would cost. But the fact was clearly indicated earlier that those districts which knew the most about the project and its offerings tended to participate in it.

One of the superintendents interviewed described an excellent procedure to insure the effective transmission of information from the conference room to the district office. His representative at the PRIMES session was given ten days to file a written report. A card noting this responsibility was prepared and filed on the day of the session. Ten days later, this card was examined. If the report had not yet been submitted, both the representative and the superintendent were notified daily until the responsibility was met.

The primary reasons given for rejecting the project were also examined. The analysis of the data gathered in this area is invaluable to the developers of the PRIMES project and might be of interest to proponents of other curriculum innovations. Table XXIII lists the reasons given by the school district administrators for rejection of the PRIMES project.

TABLE XXIII

REASONS GIVEN FOR REJECTION OF PRIMES PROJECT

	Reason	Number	Percent
1.	No reasons offered for rejection	15	30
2.	Did not know enough about the project	9	18
3.	Had other curriculum commitments	6	12
4.	Project did not seem to offer enough	4	8
5.	Too much time involved	2	4
6.	Could not see what project offered	2	4
7.	Not ready to work in mathematics	2	4
8.	Financial	1	2
9.	Not sufficient personnel	1	2
10.	District already working beyond what project had to offer	1	2
11.	Did not see need for project	1	2
12.	Combination of numbers 3 and 8	1	2
13.	Combination of numbers 3, 8, and 9	1	2
14.	Combination of numbers 3, 5, and 7	1	2
15.	Combination of numbers 3, 5, and 8	1	2
16.	Combination of numbers 3 and 5	1	2
17.	Combination of numbers 4 and 6	1	2
		N=50	100 Total

A combination of numbers 1, 2, and 6 (6 and 2 are actually related) account for fifty-two percent of the rejections. This is to say that more than half the districts had no specific reason for rejecting the project or did not know enough about the project to see its value. Again, this has to be put in context with the fact that the districts which knew the most about the project and its services accepted it in order to realize the importance of this finding.

Other Curriculum Projects

Suspecting that other curriculum commitments may be reasons for rejecting the PRIMES project, the study attempted to determine the number of projects engaged in at the elementary-school level by all the districts involved. A point biserial correlation mode was used to analyze the data in order to test the following null hypothesis: there is no significant difference in the number of curriculum projects in which the school districts were engaged at the time the PRIMES project was offered between the districts which elected to join the project and those which rejected it.

The r_{pbi} of .16263 yielded by analysis of the data was not significant at the .05 level set for acceptance. Therefore, the null hypothesis was accepted. It is assumed that the districts which accepted PRIMES were engaged in a significant number of curriculum projects as the districts which rejected it. Table XXIV illustrates the data for the finding listed above.

TABLE XXIV

CURRICULUM PROJECTS IN WHICH DISTRICTS WERE ENGAGED WHEN PRIMES PROJECT WAS OFFERED

School Districts In PRIMES Number	Subject Area	School Districts Not In PRIMES Number

	IN	OUT
0	0	7
1	1	13
2	3	19
3	2	4
4	0	3
5	1	4

$$r_{pbi} = \frac{(M_p - M_t)}{\sigma_t} \sqrt{\frac{N_p}{N_q}}$$

$$r_{pbi} = \frac{(2.57 - 1.98)}{.36} (.3741)$$

$$r_{pbi} = .16263$$

CHANGE IN ATTITUDE

The fourth section of this chapter deals with the change in attitude toward the PRIMES project as a result of the school administrators hearing firsthand in a face-to-face situation the information given to them through the mail and at the meetings. The superintendents were then asked if they would now be ready to accept the project.

Of the fifty school districts which rejected the PRIMES project, twenty-two (forty-four percent) of the school administrators felt that they had a more positive attitude toward PRIMES now that they understood more about it. Forty-eight percent were noncommittal in their attitude and gave no response, while eight percent still felt that PRIMES did not have enough to offer their district.

In response to whether or not they would now like to engage in the PRIMES project, twenty-four percent of those who rejected the project were noncommittal and gave no response; four percent still gave a definite no to the project, and six percent were undecided. An overwhelming sixty-six percent of the school administrators were now willing to become commited to the PRIMES project. Table XXV shows these findings.

TABLE XXV

PRESENT ATTITUDE TO THE PRIMES PROJECT

Attitude Toward Project	Number	Percent
More Positive - Understand Better	22	44
No Change	4	8
No Response	24	48
	N=50	Total 100
Interested in Becoming Involved in PRIMES	**Number**	**Percent**
Yes	33	66
No	2	4
Undecided	13	26
No Response	12	24
	N=50	Total 100

The findings above are perhaps the most significant in the study. They parallel, of course, the suggestions of the superintendents who called for a face-to-face meeting for any project as important as PRIMES. The number of districts ready to become involved in the project was better than four times the number of school districts which initially accepted the project. This is a finding which cannot be ignored.

Recommendations of School District Superintendents

The interview sessions gave the investigator a face-to-face exposure to the key school administrators of three large counties. The combined background and experience of these men offered a rich pool of information. The investigator therefore solicited suggestions for improving the techniques of introduction and implementation of innovative curriculum projects. The following suggestions were offered by the school administrators involved in this study. Most of the suggestions offered below were voiced by several administrators rather than being the specific suggestion of one school superintendent.

The first and most frequently articulated of all the suggestions was a request for a face-to-face meeting with the chief school administrator and key administrators on his staff. Several superintendents voiced dissatisfaction with large group meetings in that they frequently had specific goals or problems that might not fit the context of the meetings. They felt that meetings too often covered only the vague generalities of the proposed project and did not offer them the opportunity to investigate a specific application to their own district.

The superintendents further suggested the formulation of a brief (half-sheet typed) informative description of the proposed project accompanied by a response sheet which obligated the superintendent to react to a specific request for compliance, a request for further information, or a total rejection of the project with stated reasons for rejection. The superintendents felt that the brief description would suffice to present the highlight of the project. They could then respond with an acceptance or request for further information. The signed rejection slip would obligate the superintendent to read the proposal carefully before making a decision. The reasons supporting the rejection would inform the sender of the deficiencies of their program, the weakness of their informative resume, or the lack of understanding on the part of the proposed recipient.

The administrators also suggested the introduction of the innovative project via workshops where the participants would actually use the proposed materials, techniques, etc., and apply them to their own specific district needs. This would offer the administrator the opportunity to see the advantages of the project as they refer specifically to his school districts' problems.

Another suggestion involved a telephone conference with each school district administrative staff. Questions and answers could then be geared to the specific needs of the individual school district.

One school district superintendent suggested the application of an accountability check. The superintendent has his secretary record the date of any meeting or conference attended by his administrative staff. They would then have ten days in which to file a report with his office. If the report was not sent within ten days both the superintendent and the designated administrators received daily notices of the work due until the situation is resolved.

One factor seems quite clear; the majority of the suggestions strongly propose more personal contact with the informative sessions geared to the specific needs of each school district. It would seem that their point should be well taken. This method of introducing an innovation would offer the proposed recipient of the project the opportunity to see its specific application to his own circumstances. Misunderstandings and misconceptions could be resolved more easily on a one-to-one basis. This direction seems to offer sound direction to the curriculum innovator.

Chapter V

SUMMARY, CONCLUSIONS, IMPLICATIONS AND RECOMMENDATIONS

SUMMARY

The major purpose of the study was to investigate the factors which seemed to affect the decision-making process as it related to the acceptance or rejection of the PRIMES project. The study in addition attempted to extend these findings to aid in the introduction, dissemination, and implementation of other innovative programs. The study was divided into several specific areas of investigation.

The decision-making process was studied to determine the major factors which caused the acceptance or rejection of the PRIMES project. This process was studied in terms of its application in each of the school districts involved in this study. The degree of understanding and knowledge of the PRIMES project and its services was investigated to determine its affect upon the decision to accept or reject the project. The study also sought to determine the degree to which on-going curriculum projects affected acceptance or rejection of the project. The districts were surveyed in order to ascertain whether or not an updating of information about the PRIMES project could change the decision to reject the project.

No study of the decision-making process could omit investigating the key factor in the process, the decision maker himself. The study collected and analyzed data that dealt with the administrators who attended the conference, the individuals who were charged with the responsibility to make the decision, and the people who were most influential or had the most potential to affect the decision. The administrative structure of the individual school districts were also studied as a potential factor in acceptance or rejection of the PRIMES project.

The study, conducted in southeastern Pennsylvania, involved all the school districts in Chester, Delaware, and Montgomery Counties. The superintendent and key school ad-

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ministrators of each of these districts was interviewed face to face to gather the data. Supplemental data such as district size, pupil population, and per-pupil expenditure was gathered from the statistical records of the three county offices.

CONCLUSIONS

Five major factors were considered in this study. First, communication was investigated in terms of the manner in which it affects curriculum, curriculum innovation, and decision making. Second, the school administrator's perception of the PRIMES project was studied. This was followed by analysis of the administrative structure of the school districts in the study. Next, the effect of the updating of information about the PRIMES project and its services was studied in terms of whether or not it affected a change in decision to become involved in the project. Finally the suggestions of the chief school administrators were considered in light of deriving potential direction for more efficient and effective modes of introducing and gaining acceptance for innovative curriculum projects.

Communication

The superintendent was designated as the major recipient of curriculum mail by both the school districts which elected the PRIMES project and those which rejected it. Eighty-six percent of the school districts electing PRIMES designated the superintendent as the major recipient, and ninety percent of the school districts rejecting the project designated the superintendent as the major recipient.

The curriculum supervisor was also termed a major recipient of curriculum mail since seventy-one percent of the school districts in PRIMES designated him for this position while sixty-four percent of the districts rejecting the project assigned him as a major recipient.

A third major recipient of curriculum mail was the elementary-school principal; forty-three percent of the group in PRIMES and eight percent of the group rejecting PRIMES named him for this position. It should be noted however that forty-eight percent of the group rejecting the project felt that he received curriculum mail even though he might not be designated as a major recipient.

Other recipients of curriculum mail were the mathematics-department chairman, the elementary-mathematics coordinator, the mathematics committee chairman, the elementary supervisor, and individual teachers.

The three major recipients of curriculum mail in rank order therefore are the superintendent, the curriculum supervisor, and the elementary-school principal.

The assistant superintendent in charge of curriculum was the major individual to whom curriculum mail was rerouted. Eighty-six percent of the districts in PRIMES named him as major recipient of rerouted curriculum mail as opposed to sixty-eight percent for the districts not in PRIMES. The principal, the K-12 mathematics coordinator, and the elementary-school mathematics supervisor--in rank order--were also designated as recipients of the rerouted curriculum mail.

Other individuals to whom the curriculum mail could be rerouted were the mathematics supervisor, the elementary-mathematics coordinator, the curriculum supervisor, and individual teachers.

Exposure to PRIMES Materials

There was a significant relation between the number of exposures to PRIMES project materials or conferences and the acceptance of the project. The point-biserial correlation yielded an r_{pbi} of .513 which was sufficient to safely reject the null hypothesis that there will be no significant relation between the number of exposures a district had to PRIMES materials or conferences and whether the school district accepted or rejected the project.

First Personal Source of PRIMES information

The first persons to know about the PRIMES project and to act as personal sources of information within the school districts were the assistant superintendent for curriculum, the principal, and the mathematics supervisor in the participating districts; the superintendent, the assistant superintendent for curriculum, the elementary-mathematics supervisor, the principal, the mathematics supervisor, teachers, and the mathematics-department chairman--in that order--were designated as the first source of information about the project in the districts rejecting PRIMES.

Effectiveness of the PRIMES Publications

Several factors indicating the effectiveness of the PRIMES publications were investigated. The number of publications received by a school district was significantly related to their acceptance of the project. The point-biserial r_{pbi} of .333 was significant at the .05 level of

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confidence and invalidated the null hypothesis that there is no significant relation between the number of publications received by the school districts from the PRIMES project centers and whether or not the school district accepted the project.

Districts which accepted the project had retained more of the informative literature about PRIMES than those districts which rejected it. A chi-square score of 5.016, significant at the .05 level of confidence, was sufficient to reject the null hypothesis that there was no significant difference between the number of pieces of informative materials retained by the group of school districts which accepted the PRIMES project and the number of pieces retained by the group which rejected the project.

The group of school districts that accepted the PRIMES project were just as critical of the written materials sent to them and perceived as significant a number of weaknesses in them as the school districts that rejected the project. The perceived weaknesses in the written material were not, therefore, a significant factor in the acceptance of the project. The chi-square score yielded by analysis of the data was 0.033, which was not significant at the .05 level of acceptance and invalidated the null hypothesis that there is no significant difference in the number of weak points listed for the written PRIMES information materials either by the group which accepted the project or by the group which rejected it.

Perhaps one of the most significant findings of this study is that the school districts which elected PRIMES identified significantly more specific project offerings than the group which rejected it. It was concluded therefore that the greater the number of specific aspects of an innovative project identified and understood by the potential recipient the more the likelihood that the project will be accepted. The chi-square score of 8.867, significant at the .01 level of acceptance, led to the rejection of the null hypothesis that there is no significant differences in the number of specific project offerings identified as strengths between the groups which elected the PRIMES project and the groups which rejected it.

Effectiveness of PRIMES Conferences

It was concluded that the number of conferences attended by the potential users of the PRIMES project definitely affected the decision to accept the project and that the group of participants which chose to utilize the project attended a significantly greater number of conferences. Analysis of data yielded a chi-square score of 5.398, significant at the .05 level of confidence, and invalidating the null hypothesis that there is no signifi-

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cant difference between the number of conferences attended and the acceptance of the PRIMES project by a group of school districts.

An interesting conclusion drawn from the findings was that the attitude toward the conferences was the same for both the group accepting the project and the group of schools rejecting PRIMES. Strangely, the group rejecting the projects were no more negative in their attitude toward the conferences than the group accepting the project. The chi-square score of .0934 yielded through analysis of the data was not significant at the .05 level of confidence and invalidated the null hypothesis that there is no significant difference in the direction of the attitude (positive or negative) between the group of schools which accepted the project and those which rejected it.

Understanding and Perception of the PRIMES Project

There was a very strong relation between the degree of familiarity that the school district's administrators had with the project and its acceptance. The school district administrators who accepted the PRIMES project felt much more familiar with the project than did the administrators which rejected it. Analysis of the data yielded a chi-square score of 14.763 significant at the .001 level of confidence, which led to the rejection of the null hypothesis that there will be no significant difference in the response given to a query attempting to determine the degree of familiarity with the PRIMES project between those school district administrators which accepted the project and those which rejected it.

The following three conclusions are directly related and should be considered as a composite even though each is independently significant. First, the school district administrators which accepted the PRIMES project definitely understood a greater number of the specific services offered by the project. This would strongly verify the conjecture that the greater the number of the specific services understood, the greater the inclination to accept the project. The chi-square score of 6.697 yielded by analysis of the data was significant at the .01 level of confidence and invalidated the null hypothesis that there is no significant difference in the number of PRIMES services understood by the school district administrators which accepted the PRIMES project and those which rejected it.

Second, the school district administrators which elected to accept the PRIMES project were impressed by a greater number of the specific services offered by the project than those administrators which rejected. A greater understanding of an innovative project and its concomitant offerings would lead to a more positive impression of that project. The chi-square score of 12.695 yielded by analysis of the data was significant at the .05 level of confidence and invalidated the null hypothesis that there is no significant difference between the number of aspects of the PRIMES project which impressed the school administrators who elected to join the project and those who rejected it.

Third, the school district administrators which accepted the PRIMES project considered more services valuable than those who rejected. The chi-square score of 10.214, significant at the .01 level of confidence, invalidated the null hypothesis that there is no significant difference between the number of services deemed valuable by the school administrators which elected to join the project and those which rejected it. One must consider the significance of the three conclusionx reached above, especially in light of their direct bearing upon the successful acceptance of an innovative curriculum project.

School district administrators which accepted the project saw a significantly greater number of relative advantages in the offerings of the PRIMES project than those districts which rejected it. The chi-square score of 5.804 was significant at the .02 level of confidence and lead to the rejection of the null hypothesis, there is no significant difference between the number of PRIMES services felt to have relative advantage by those school district administrators who elected the project and those who rejected it.

Administrative Curriculum Personnel

School districts which accepted the PRIMES project all had a functioning mathematics committee; this seemed a significant factor when on notes that only the school districts which rejected the project had a mathematics committee functioning at the time the project was offered.

There was no significant relation found between the number of administrative personnel employed in curriculum and whether or not the district administrators chose to join the project. Analysis of data yielded a chi-square score of 0.934 which is not significant at the .05 level of confidence, and lead to the acceptance of the null hypothesis that there is no significant difference in the number of curriculum personnel employed at the administrative level and in the group which accepted the PRIMES project and the group which rejected it.

Financial Considerations

One should note that there was no significant difference in the per-pupil expenditure for the group of school districts which accepted the PRIMES project and the group which rejected it. The point-biserial correlation score of -.016 was not significant at the .05 level set for acceptance thereby validating the null hypothesis that there is no significant difference in the per-pupil expenditure for the group of school districts which elected to join PRIMES and those which rejected it.

It was also concluded that there was no significant difference between the number of pupils below the poverty level in the school districts which elected PRIMES and those which rejected it. The point-biserial correlation score of -.037 was not significant at the .05 level set for acceptance thereby validating the null hypothesis that there is no significant difference in the number of pupils below the poverty level in the school districts that elected the PRIMES project and those which rejected it.

Apparently the school district administrators which selected the PRIMES project envisioned the potential financial burden in a similar manner to that seen by the administrators which rejected the project. The null hypothesis that there is no significant difference in the number of school district administrators who perceived a possible financial burden between the group of school districts which elected the PRIMES project and the group which rejected it was accepted since the chi-square score of 3.391 was not significant at the .05 level.

Similarly, the group which accepted the project and the group which rejected the project viewed the potential financial burden in the same manner. The chi-square score of 1.698 was not significant at the .05 level of confidence and allowed the acceptance of the null hypothesis that there is no significant difference in the manner in which the school administrators viewed the degree of financial burden imposed by the PRIMES project between the group which accepted the project and those which rejected it.

Size of the Districts

The size of the pupil population within the school districts electing PRIMES was not significantly different from the size of the pupil population in the districts rejecting the project. The r_{pbi} of .069 was not significant at the .05 level; therefore the null hypothesis that there is no significant difference in the total number of students attending the schools in districts which accepted the project and those which rejected it was accepted. The same was true when the independent analysis was completed for the elementary school student population. This separate analysis was included because the PRIMES project was geared to the elementary-school level.

Decision-Making Process

The superintendent, or superintendent and assistant superintendent, or the superintendent and the school board were designated as the major decision makers in the selection or rejection of the PRIMES project.by seventy-one percent of the school districts which elected the project and by seventy-four percent of the districts which rejected the project.

Primarily, the PRIMES project was rejected by default rather than by a direct decision to turn down the project. Sixty-eight percent of the districts rejecting the project noted that no official decision was reached.

The PRIMES project was rejected without any specific reason by a majority of the school districts to whom it was offered. Fifty-two percent of the rejecting districts had no specific reason for refusing the project.

Other Curriculum Projects

The districts which rejected the project did not do so because they were engaged in more curriculum endeavors than the accepting districts. The r_{pbi} of .16263 was not significant at the .05 level and the null hypothesis that there is no significant difference in the number of curriculum projects in which the school districts were engaged at the time the PRIMES project was offered between the districts which elected to join the project and those which rejected it was accepted.

Change in Attitude

After a face to face meeting in which the superintendent receives personally the specific information about an innovative curriculum project and what it offers he will be more inclined to accept it. This conclusion was based upon the fact that after the review given personally to school district superintendents an overwhelming sixty-four percent now elected to become engaged in the project. This included thirty-three school districts as opposed to the original seven districts accepting an increase of over four hundred percent.

IMPLICATIONS

The implications which followwere derived from the findings and conclusions of this study. They cite specific directions that demand special attention. They will be used as a basis for the recommendations which will follow. The implications listed below must be considered as a fecal point by the personnel of the PRIMES project itself and curriculum innovators in general because they single out several specific areas from among the mess of factors which affect the curriculum developer. These factors may be the causes for failure or at best contribute significantly to the failure of potentially important curriculum innovations.

There is not a single curriculum agency to which all curriculum information will be sent once it enters a given school district.

There is not a well defined curriculum agency within each school district which is responsible for reviewing all curriculum materials sent to the school district.

The number of exposures that the curriculum agents of a school district have to an innovative curriculum project affects their acceptance of the project.

The retention of informative brochures, advanced publications, descriptive notifications seem to have a direct bearing on the acceptance of the project or innovation that is the subject of that mail.

The greater the number of specific offerings understood by the administrators of a school district the more likely they are to accept that innovation.

School districts which have an active curriculum committee functioning at the time a curriculum innovation is offered will be more likely to accept the innovation that falls within the scope of the subject matter for which they are responsible.

Financial considerations do not seem to play as great a role in the acceptance of a curriculum innovation as might be initially expected.

Although the superintendent is designated as a decision maker in curriculum matters and may be the only individual with the legal status to make curriculum decisions in small school districts, he frequently is not directly involved in the decision to accept or reject a curriculum project.

Most significantly, many innovative curriculum projects are rejected through default;no official decision is reached in terms of the acceptance or rejection of the project.

Activity in other curriculum areas will not hinder the acceptance of the curriculum innovation which is understood and considered important by school administrators.

A face-to-face meeting which introduces an innovative curriculum project to the official decision makers of an individual school district increases the probability of its acceptance.

RECOMMENDATIONS

The multitude of breakthroughs in the technology of education the many projects in educational research yielding significant results, and the increased number of curriculum agencies supplying information for schools have placed an unbearable communication burden upon school administrators. New and complex administrative structures and the increasing number of demands for the administrators' time have increased the need for efficient and effective communication. An agency created within the school district itself, specifically designed to receive, sort, and redistribute all curriculum mail should go a long way toward facilitating more effective and efficient communication.

To make the above agency a more effective instrument of communication, each district should establish a mail route with specific individuals, groups, and committees designated as recipients of mail for which they would be primarily responsible. This route would tend to be a more direct way of getting information and communication to those individuals or groups who would have experience and responsibility for acting upon them. If this route were supported by a dated checklist for incoming mail, as well as a storage and retrieval system for this mail, it would decrease the possibility of important or valuable information being lost or sidetracked out of circulation. This system would lend itself strongly to accountability, a direction in which the modern school administrator seems to be heading.

The suggestion given by the one school superintendent of an accountability file could easily include as a part of this file the mail system. Direct action should be taken on all curriculum proposals or offerings even if the action is merely that the project offered was turned down and the specific reasons for its rejection made a matter of record.

An official chain of command with prescribed channels could be an integral part of this system. Projects, proposals, and offerings deemed significant should follow a series of intermediate steps with accurate records kept to indicate actions taken.

A major factor involved in the PRIMES project was the saving of thousands of hours of teacher and administrator time. This fact alone would seem to support the idea that the time lost in the development and implementation of the mail communication system described above could have been easily recouped by any district that becomes involved in the project to say nothing of any other valuable innovations that lost to the district through default.

Since the number of specific offerings of the project understood by the school administrators had a direct bearing upon their acceptance, it would seem reasonable that innovative project directors should solicit reactions to their projects that would clearly indicate the degree to which their project was understood. This would offer direction for the program directors in terms of how well their program was understood. Remedial or corrective actions could then follow.

Permanent subject-matter curriculum committees would seem to be far more effective in the analysis of a prospective curriculum innovation. They would have the interest and expertise necessary to make the most effective recommendation. Obviously this effort, if done for remuneration, would add incentive to develop expertise and at the same time provide talent pools in each academic area that could be tapped when necessary. It would not be necessary for the committee to be working on specific tasks at all times; one of their major functions would be to review curriculum offerings that are made to their district.

The final recommendation is that the directors of innovative projects have periodic face to face meetings with the school superintendent and key decision makers in order to gain and maintain support for their project. Although this seems to be more time consuming than large conferences, it is a far more successful way to gain an understanding of and acceptance for new and different curriculum ideas.

APPENDIX A

COMPLETE LISTING OF THE SCHOOL DISTRICTS INVOLVED IN THIS STUDY

SCHOOL DISTRICTS

1. Abington
2. Avon-Grove
3. Bristol Township
4. Cheltenham
5. Chester City
6. Chester Township
7. Chichester
8. Clifton Heights
9. Coatesville
10. Collingdale
11. Colonial
12. Darby-Colwyn
13. Darby Township
14. Downingtown
15. Folcroft
16. Garnet Valley
17. Hatboro-Horsham
18. Haverford
19. Interboro
20. Jenkintown
21. Kennett
22. Landowne-Aldan
23. Lower Merion
24. Lower Moreland
25. Marple-Newtown
26. Nether Providence
27. Norristown
28. North Penn
29. Octorara
30. Owen J. Roberts
31. Oxford
32. Penn Delco
33. Perkiomen Valley
34. Phoenixville
35. Pottsgrove
36. Pottstown
37. Radnor
38. Ridley
39. Rose Tree Media
40. Sharon Hill
41. Smedley
42. Springfield (Delaware)
43. Springfield (Montgomery)
44. Spring-Ford
45. Sourderton
46. Swathmore
47. Tredyffrin-Easttown
48. Unionville-Chadds Ford
49. Upland
50. Upper Darby

51. Upper Dublin
52. Upper Merion
53. Upper Moreland
54. Upper Perkiomen
55. West Chester
56. Wissahickon
57. Yeadon

APPENDIX B

PRIMES QUESTIONNAIRE

INVITATIONS TO PRIMES MEETINGS

PRIMES QUESTIONNAIRE

1. List of curriculum personnel

    A. Assistant Superintendent for Curriculum

    B. Mathematics Supervisor, K-12

    C. Elementary-Mathematics Supervisor (Coordinator)

        1. Full-time
        2. Part-time
        3. Number of elementary schools supervised: ____________________

    D. Others: ____________________

    ____

2. Mail dealing with curriculum (from state department, book companies, etc.) is sent to:

    A. Superintendent

    B. Curriculum Supervisor (Assistant Superintendent)

    C. Mathematics Supervisor

    D. Principals

    E. Mathematics-Department Chairman

    F. Elementary-Mathematics Coordinator

    G. Others: ____________________

    ____

3. Mail may be re-routed to:

    A. Assistant Superintendent for Curriculum

    B. Mathematics Supervisor

    C. Principals

    D. Elementary-Mathematics Supervisor (Coordinator)

    E. Others: ____________________

    ____

4. Are you familiar with the PRIMES Project?

YES_____ NO_____ VAGUELY_____

If NO, who in your district would be included to know about it?

5. What exposure have you had to PRIMES?

A. State Department

B. Letters

C. Brochures

D. Convention Presentations

E. Steering Committee Meeting

F. County Presentations

G. Local Presentations

H. Filmstrip

I. Others: ______________________________

____

6. Who was your first major source of information about PRIMES?

A. Assistant Superintendent

B. Mathematics Supervisor

C. Elementary-Mathematics Supervisor

D. Mathematics-Department Chairman

E. Principal

F. Teachers

G. Filmstrip

H. Others: ______________________________

____

7. How do you view PRIMES? What services do you feel that it can offer you, your district?

   A. Know very little about PRIMES
   B. Curriculum Description
   C. Textbook Analysis
   D. Textbook Selection
   E. Scope and Sequence
   F. Content Outline
   G. Behavioral Objectives
   H. Others: ______________________________

   ____

8. What impressed you most about PRIMES?

   A. Services
   B. Personnel
   C. Content Listing
   D. Behavioral Objectives
   E. Curriculum Description
   F. Others: ______________________________

   ____

9. What do you consider the most valuable factor that PRIMES can offer your district?

   A. Experts
   B. Consultants
   C. Content Outline
   D. Behavioral Objectives
   E. Others: ______________________________

   ____

10. Do you think that the PRIMES personnel have anything to offer beyond that which your district currently has?

    A. Experts

    B. Consultants

    C. Content Outline

    D. Behavioral Objectives

    E. Others: ____________________________

    ____

11. Which conferences have your personnel attended?

    A. Pittsburgh

    B. West Chester

    C. County

    D. Allenberry

12. What PRIMES publications and/or notifications have you received?

    A. Letters

    B. Brochures

    C. Notifications of County Meetings

    D. County Superintendent Notification

    E. Others: ____________________________

    ____

13. What materials do you have on hand?

    A. ____________________________________

    B. ____________________________________

14. What were the weak points of the written information received?

A. Not Clear

B. Too Technical

C. Not Inclusive Enough

D. Others: ______________________________

____

15. What do you view as the strongest aspects (in an information sense) of the written material received about PRIMES?

A. ______________________________

B. ______________________________

C. Its offering:

•. Content Description
2. Behavioral Objectives
3. Testing Information
4. Consultant Help
5. Curriculum Guide
6. Others: ____________________

____

16. How did you react to the oral presentation?

A. Positive - Why?

1. Its offering:

a. Curriculum Description
b. Curriculum Help
d. Materials
d. Experts
e. Others: ______________

____

B. Negative - Why?

1. Not Clear

2. Did not seem to offer much

3. Could not see its application in your district

4. Seemed too costly

5. Seemed to require too much expertise

6. Others: ______________________________

____

17. Do you feel that involvement with PRIMES would place a financial burden on your district?

YES______ NO______

A. Great

B. Reasonable

C. Little

18. What do you see as the greatest expenses involved in PRIMES? (Check one or more)

A. Consultants--from West Chester PRIMES Office

B. State Consultants

C. Teacher Release Time

D. Secretarial Help

E. Extra Pay for Teachers

F. Materials

G. Others: ______________________________

____

19. Who would make the decision to become involved in PRIMES?

A. Superintendent

B. School Board

C. Assistant Superintendent

D. Mathematics Supervisor

E. Elementary-Mathematics Supervisor

F. Principal

G. Mathematics Department Chairman

H. Others: ______________________________

____

20. How was the final decision reached?

A. Superintendent Decided

B. Committee Decided

C. Assistant Superintendent for Curriculum Decided

D. Not sufficient interest to reach a decision

E. Others: ______________________________

____

21. Why did you choose (not choose) to become involved with PRIMES?

A. Other Curriculum Commitments

B. Money

C. Personnel

D. Time

E. Project does not offer enough

F. Distrist is already beyond what PRIMES has to offer

In what way? ______________________

____

G. Others: ______________________________

____

22. What do you think are the weaknesses of the PRIMES Project?

____

____

____

____

23. What elementary curriculum projects were your district engaged in when you first heard about PRIMES?

A. Language Arts

B. English

C. Social Studies

D. Reading

E. Science

F. Others: ______________________________

____

24. In view of what you now know, do you feel that PRIMES can offer your district assistance?

A. Yes - Why? ______________________________

____

B. No - Why? ______________________________

____

25. Are you interested in becoming involved with PRIMES?

A. Yes

B. No

26. Who could be designated as your district's contact with PRIMES?

A. ______________________________

B. ______________________________

PRIMES QUESTIONNAIRE

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF PUBLIC INSTRUCTION
WEST CHESTER STATE COLLEGE
CHEYNEY STATE COLLEGE

NAME______________________________**POSITION**__________

SCHOOL DISTRICT______________________________________

ADDRESS______________________________________
Street **City** **Zip Code**

1. **Who is responsible for the elementary mathematics program in your district?**

   ____________________**Position**____________

   Telephone No. ____________
   A.C.

2. **Current Elementary Mathematics Textbook Series**

   ____
   Title **Publisher** **Pub. Date**

   ____
   Title **Publisher** **Pub. Date**

3. **Standardized Achievement Tests in Use**

   ____
   Title **Publisher** **Pub. Date**

   ____
   Title **Publisher** **Pub. Date**

4. **Interested in Service?**

   Yes ________ **No**__________
   Undecided__________

   Signed____________________

   Date ____________________

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MONTGOMERY COUNTY SCHOOLS
COURT HOUSE
Norristown, Penna. 19404

February 26, 1968

TO: Chief School Administrators, Assistant Superintendents in Charge of Instruction, and Elementary Principals.

FROM: Dr. Harry N. Gasser and Louis A. Krug, Assistant County Superintendents

SUBJECT: PRIMES Mathematics Program Presentation

An important meeting concerning ways of developing, studying and evaluating elementary mathematics programs (K through 6) has been planned for teachers, supervisors and administrators in Montgomery County. Research and mathematics advisors of the Department of Public Instruction, Director of the Education Development Center, and West Chester State College Mathematics Department professors will present the new PRIMES program (Pennsylvania Retrieval of Information for Mathematics Education System).

Two purposes are to be served by this meeting: (1) The details of the PRIMES system, a Title V, ESEA project, will be explained as they apply to a variety of curriculum problems in mathematics for grades K through 6. (2) A proposal will be offered which would permit each local school to apply the PRIMES system to its own mathematics program during the remaining portion of this academic year. Individual schools may decide for themselves whether they wish to participate and how extensively they wish to do so.

DATE: Monday, March 11, 1968
TIME: 2:00 to 3:30 P.M.
PLACE: Whitemarsh Junior High School Auditorium
Colonial School District
Germantown Pike, Route 422
Plymouth Meeting, Penna.

Parking: Available on the Plymouth-Whitemarsh High School lot behind the senior high school. Entrance from Germantown Pike at west end of campus. Short walk across campus to junior high building, at east end of campus, behind senior high addition.

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DELAWARE COUNTY PUBLIC SCHOOLS
Court House Annex
Media, Pennsylvania 19063

January 25, 1968

TO: Chief School Administrators
Elementary Principals, Curriculum
Directors and Supervisors

FROM: Judson E. Newburg
Assistant County Superintendent

An important meeting concerning ways of developing, studying and evaluating mathematics programs (K to 6) has been planned for teachers, supervisors and administrators in Delaware County. Members of the Department of Public Instruction and West Chester State College will present the new PRIMES (Penna. Retrieval of Information for Mathematics Education System) program.

Two purposes will be served by this meeting. The details of the PRIMES system as they apply to a variety of curriculum problems in mathematics in grades K to 6 will be explained. A proposal that would permit each local school to apply the PRIMES system to its own mathematics program during the remaining portion of this academic year will be explained. Individual schools will decide for themselves whether they wish to participate and how extensively they wish to do so.

DATA: Thursday, February 1, 1968
TIME: 2:00 p.m. to 3:30 p.m.
PLACE: Wm. Toal Building (Auditorium)
PARKING: Parking will be permitted in the lot surrounding the Wm. Toal Building after 1:30 p.m. Entrance is from Orange Street

The William Toal Building is located at 2nd and Orange Streets, in Media, Pennsylvania.

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OFFICE OF THE COUNTY SUPERINTENDENT
THE PUBLIC SCHOOLS OF CHESTER COUNTY
COUNTY OFFICE BUILDING
MARKET AND NEW STREETS
WEST CHESTER, PENNSYLVANIA 19380
692-2660

February 20, 1968

TO: Chief School Administrators,
Elementary Principals, Curriculum
Directors and Supervisors

FROM: John N. Buch
Assistant County Superintendent

An important meeting concerning ways of developing, studying and evaluating mathematics programs (K to 6) has been planned for Elementary Principals, Curriculum Directors, Supervisors and Administrators in Chester County. Members of the Department of Public Instruction and West Chester State College will present the new PRIMES (Penna. Retrieval of Information for Mathematics Education System) program.

Two purposes will be served by this meeting. The details of the PRIMES system as they apply to a variety of curriculum problems in mathematics in grades K to 6 will be explained. A proposal that would permit each local school to apply the PRIMES system to its own mathematics program during the remaining portion of this academic year will be explained. Individual schools will decide for themselves whether they wish to participate and how extensively they wish to do so.

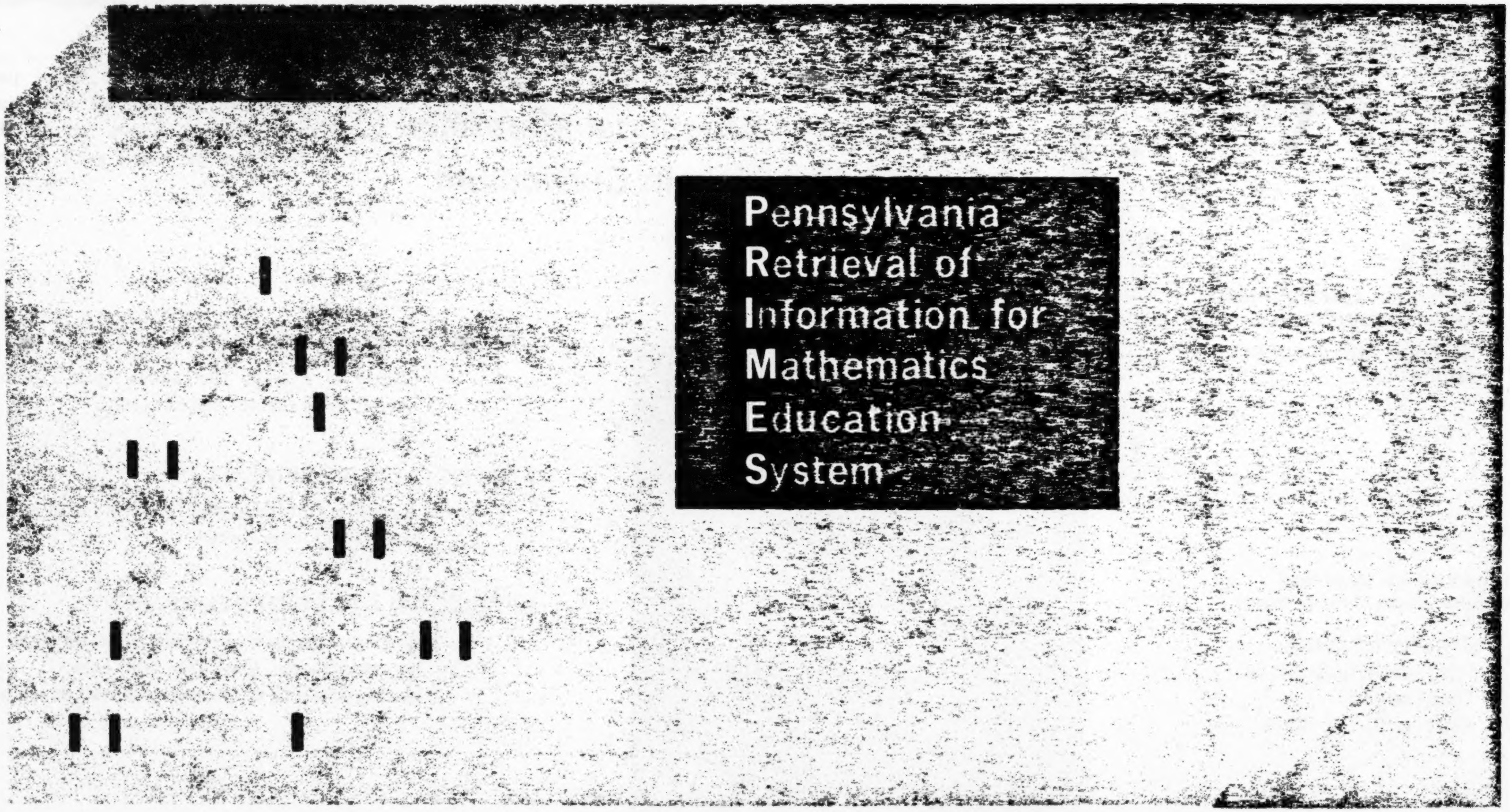
Date: Friday, March 1, 1968
Time: 10:00 a.m. - 12:00 noon
Place: Chester County Office Building
Second (2nd) Floor

APPENDIX C

SAMPLE COPY OF
PRIMES BROCHURE

COMMONWEALTH OF PENNSYLVANIA

DEPARTMENT OF PUBLIC INSTRUCTION



Pennsylvania
Retrieval of
Information for
Mathematics
Education
System

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AVAILABLE AT TIME FILMED

COMMONWEALTH
OF
PENNSYLVANIA

DEPARTMENT
OF
PUBLIC INSTRUCTION

BUREAUS OF:
- **RESEARCH ADMINISTRATION AND COORDINATION**
- **GENERAL AND ACADEMIC EDUCATION**

Supported with funds from Commonwealth of Pennsylvania

U. S. Office of Education
Public Law 89-10, Section 503
Public Law 83-531
Public Law 81-152, Title III

Centralized Curriculum Information
... an urgent need!

TO: Develop Curriculum
Select Instructional Materials
Use Materials in Curriculum

Every school district is faced periodically with the need to select an elementary mathematics text series. These factors require that this decision be made with extreme care.

LONG-TERM COMMITMENT

Choice of a given text series usually commits a district to its use for several years.

FINANCIAL INVESTMENT

Considerable financial investment is required in purchasing a text series.

EFFECT ON STAFF DEVELOPMENT

In-service programs are most effective when related to the adopted text. The final selection exerts a strong influence on professional staff development.

Collecting and analyzing available curriculum material presents a monumental task for the local school districts.

CRITERIA DEVELOPMENT

The task of developing dependable criteria for assessing curriculum materials exceeds the resources of local districts.

COLLECTION OF TEXTBOOKS

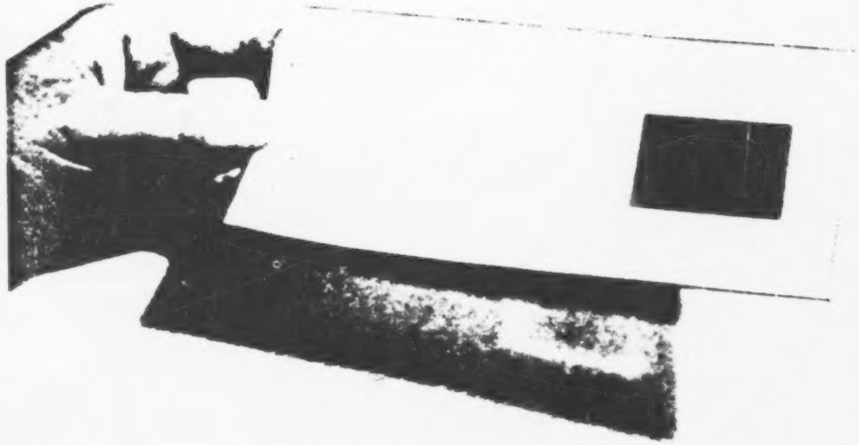
The acquisition of all basal programs is a problem for many districts. There is always the possibility that important texts might be omitted.

TEXT ANALYSIS

About 30,000 pages should be read in order to examine the existing basal programs. Imagine the teacher time wasted if this should be done in each of the State's school districts.

The PRIMES system utilizing modern technology would serve a significant need. This center will provide *comprehensive, current,* and *authoritative* curriculum information that is readily retrievable. *Each* school district in the Commonwealth will have access to the information in making decisions about curriculum materials consistent with the aims of education to which they are committed.

ets and
Numbers
ELEMENTARY SCHOOL MATHEMATICS
ELEMENTARY SCHOOL MATHEMATICS
GETTING READY 3
MODERN ARITHMETIC
DISCOVERING MATHEMATICS
DEVELOPING MATHEMATICS
NUMBERS



Pennsylvania
Retrieval of
Information for
Mathematics
Education
System

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What it is...

PRIMES consists of a lesson-by-lesson analysis of the basal programs, grades K-6. The analysis is based on authoritative standards developed by an outstanding team of specialists representing the fields of mathematics education, educational psychology, and information storage and retrieval.

Each lesson is analyzed according to its mathematical content, expected pupil behavior, and problem type. Technical vocabulary and symbolism, grade level, pre- and post-text activities are noted.

CONTENT

Each lesson is classified according to the mathematics concepts presented. A master list of more than 300 content items, classified under seven general mathematics topics, is used in assigning a content code number.

EXPECTED PUPIL BEHAVIOR

The specific pupil objectives are identified. Approximately 2,000 specific pupil objectives, stated in behavioral terms, are contained in the master list used in lesson classification. Two published programs may include material covering the same content, yet differ in pupil behaviors.

TYPE OF PROBLEM

The problems and examples included in each lesson are classified according to four main types: direct applications of lesson, review problems, extended applications (non-routine application of lesson), and exploratory activities. Further coding indicates whether the problem is presented in a computational or problem-solving format.

VOCABULARY AND SYMBOLISM

Whenever a technical term or symbol is introduced for the first time, it is entered on the analysis page and noted on the teacher's page for that lesson.

GRADE LEVEL

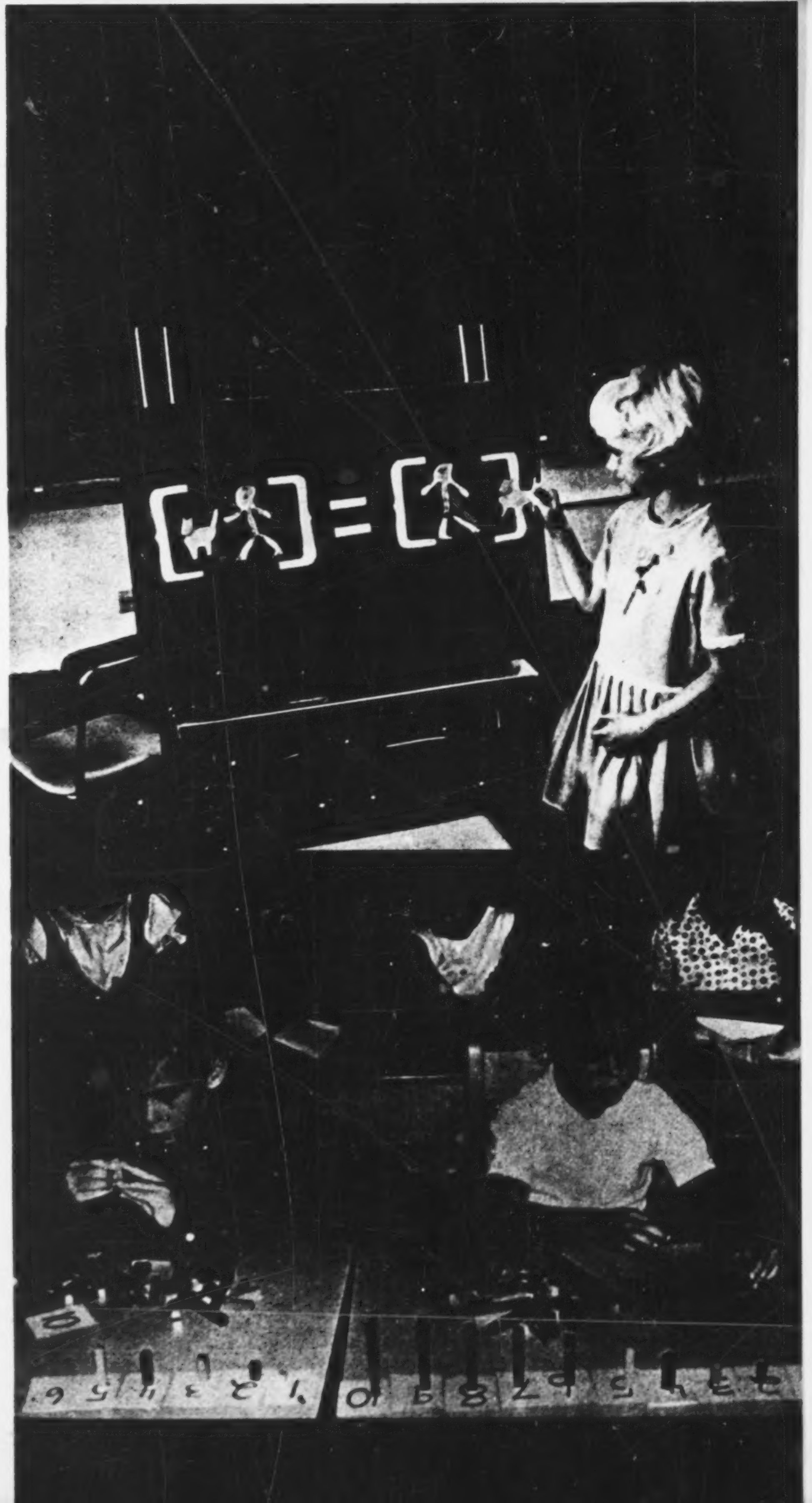
All lessons are coded according to the school year and month for which they are intended.

PRE-TEXT ACTIVITY

Suggested preparatory activities described in the teacher manual are identified.

POST-TEXT ACTIVITY

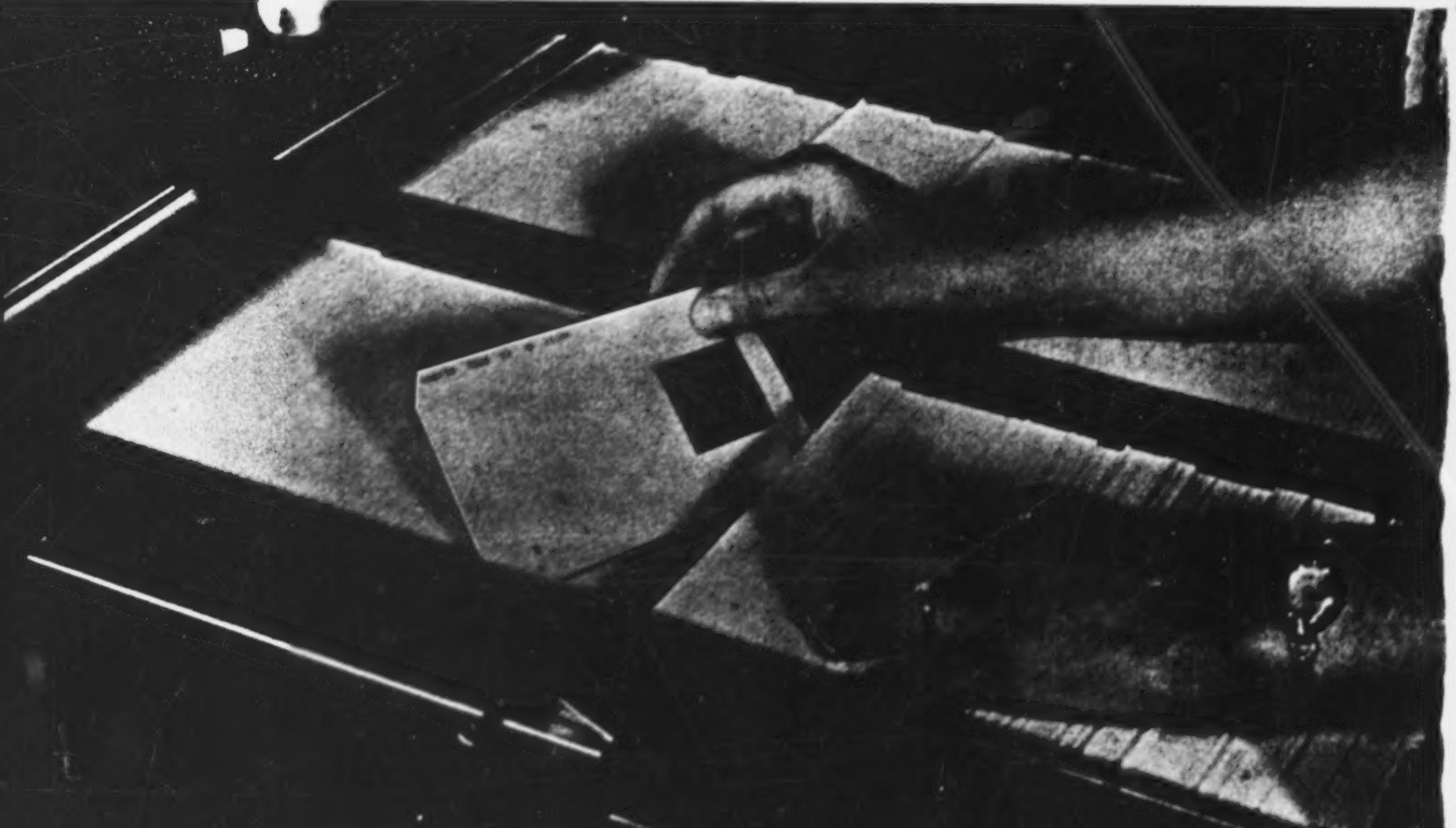
Suggested activities for lesson follow-up are similarly identified on the teacher's page.



Using The System

The system document consists of three basic elements. These are the pupil page, the teacher manual page and the analysis page.

The document is microfilmed, inserted in an aperture card, and indexed by key-punched data processing cards. This provides a file of documents for approximately 30,000 lessons. This file can be searched and the appropriate documents identified by card sorting equipment or book form indexes. The selected document cards can be conveniently read on a microfilm reader and photocopied for future reference.



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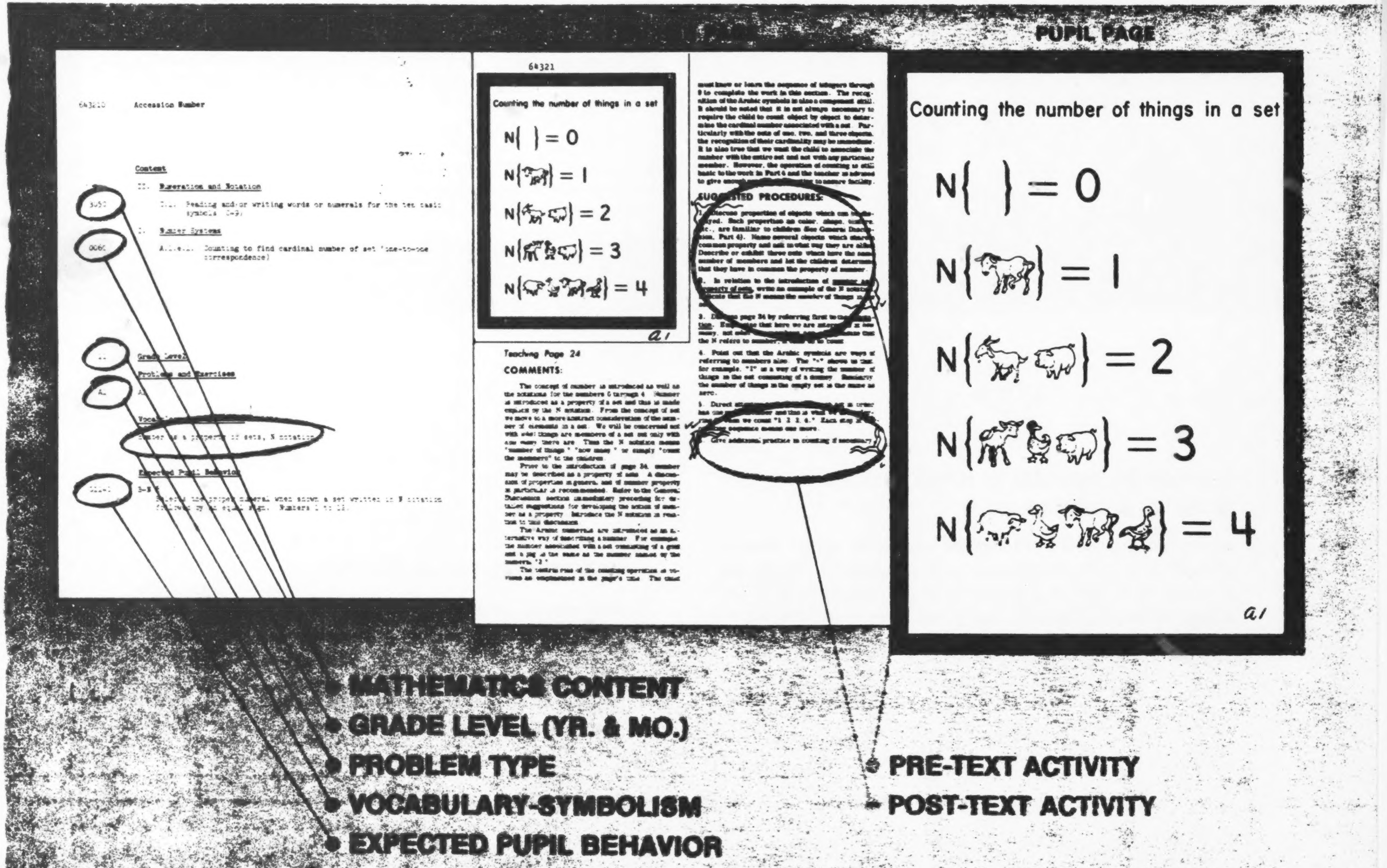
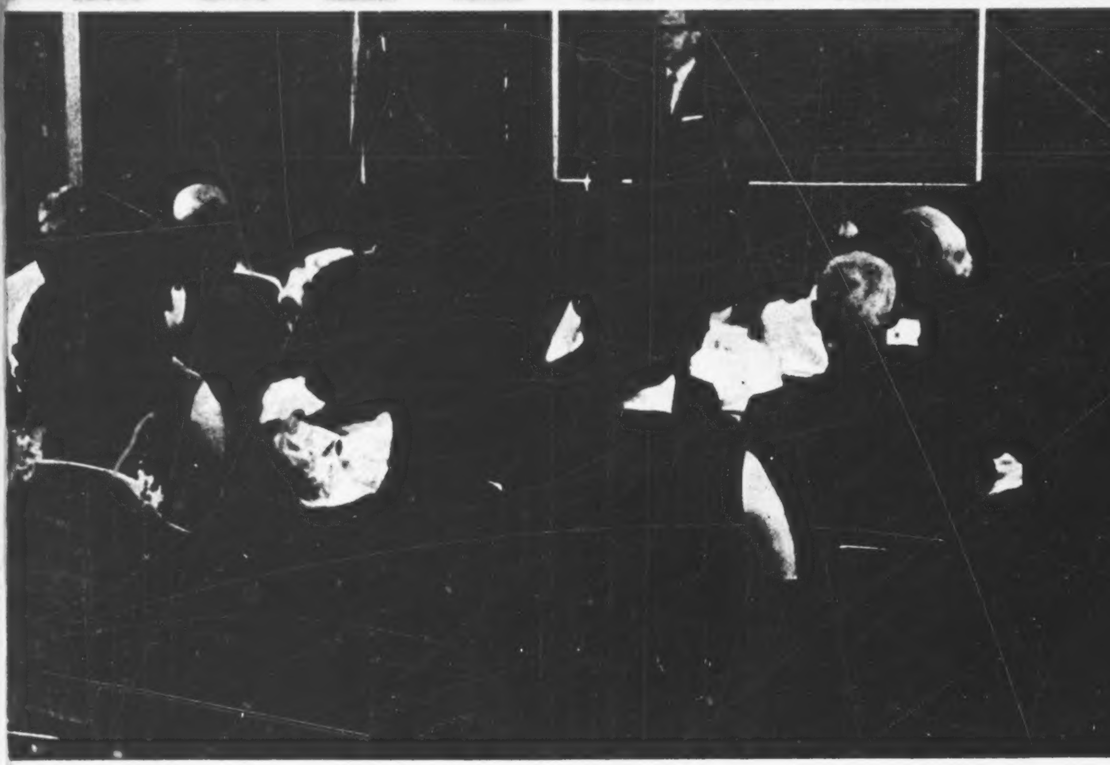
A TYPICAL SYSTEM DOCUMENT


643210 Accession Number
Content
Counting to find cardinal number of set (one-to-one correspondence)
Grade Level
Problems and Exercises
Expected Pupil Behavior
3050
0060
64321
Counting the number of things in a set
N{ } = 0
N{ } = 1
N{ } = 2
N{ } = 3
N{ } = 4
a1
Teaching Page 24
COMMENTS:
SUGGESTED PROCEDURES:
PUPIL PAGE
Counting the number of things in a set
N{ } = 0
N{ } = 1
N{ } = 2
N{ } = 3
N{ } = 4
a1

- MATHEMATICS CONTENT
- GRADE LEVEL (YR. & MO.)
- PROBLEM TYPE
- VOCABULARY-SYMBOLISM
- EXPECTED PUPIL BEHAVIOR

- PRE-TEXT ACTIVITY
- POST-TEXT ACTIVITY

100



PREPARATION ...

PRIMES is based on the policy that mathematics curriculum decisions should be made by the local district.. The system is not intended to recommend specific basal programs for use in the Commonwealth. The purpose of the system is to assist school districts in curriculum development and selection of instructional materials.

Each district should determine its specific needs and how they are to be met. The system staff suggests the following guidelines recommended by the Committee on Textbook Selection of the National Council of Teachers of Mathematics.

DETERMINING THE PLACE OF MATHEMATICS IN THE TOTAL CURRICULUM

A written philosophy should be prepared which relates mathematics to the total educational program of the district in terms of emphasis, purpose, and correlation with other school subjects. This philosophy will serve as a foundation on which to develop specific objectives.

DETERMINING THE OBJECTIVES

The specific goals of the mathematics curriculum should be stated. In developing these goals the following categories are suggested: concepts to be understood, skills to be mastered, and techniques for learning mathematics. Objectives dealing with professional growth of the teaching staff should also be outlined.

BUILDING A CURRICULUM GUIDE

Based on these objectives a curriculum guide should be formulated. Attention should be given to content, manner of presentation, instructional materials to be used, and the scope and sequence of the mathematics program for each grade level. Suggested in-service programs should also be described.

CONSIDERING LOCAL DISTRICT'S NEEDS

In all these preparatory steps, the needs of the district, its demographic composition, industry, and urban or rural make-up are factors to be considered. Provision for individual differences among learners should be reflected in the curriculum guide.

ASSESSING THE QUALIFICATIONS OF TEACHERS

It is essential in curriculum development and implementation that the qualifications and abilities of the district's teachers and the plans for staff development be considered.

10 2

Here are questions that have been processed by the system for several school districts.

Are sets used to develop number concepts and operations?

How many different ways to introduce a new topic are used in a particular program -- for example, the topic of multiplication of whole numbers or division of fractional numbers, or the development of the set of integers?

When and how are the basic number properties of commutativity, associativity, and distributivity introduced?

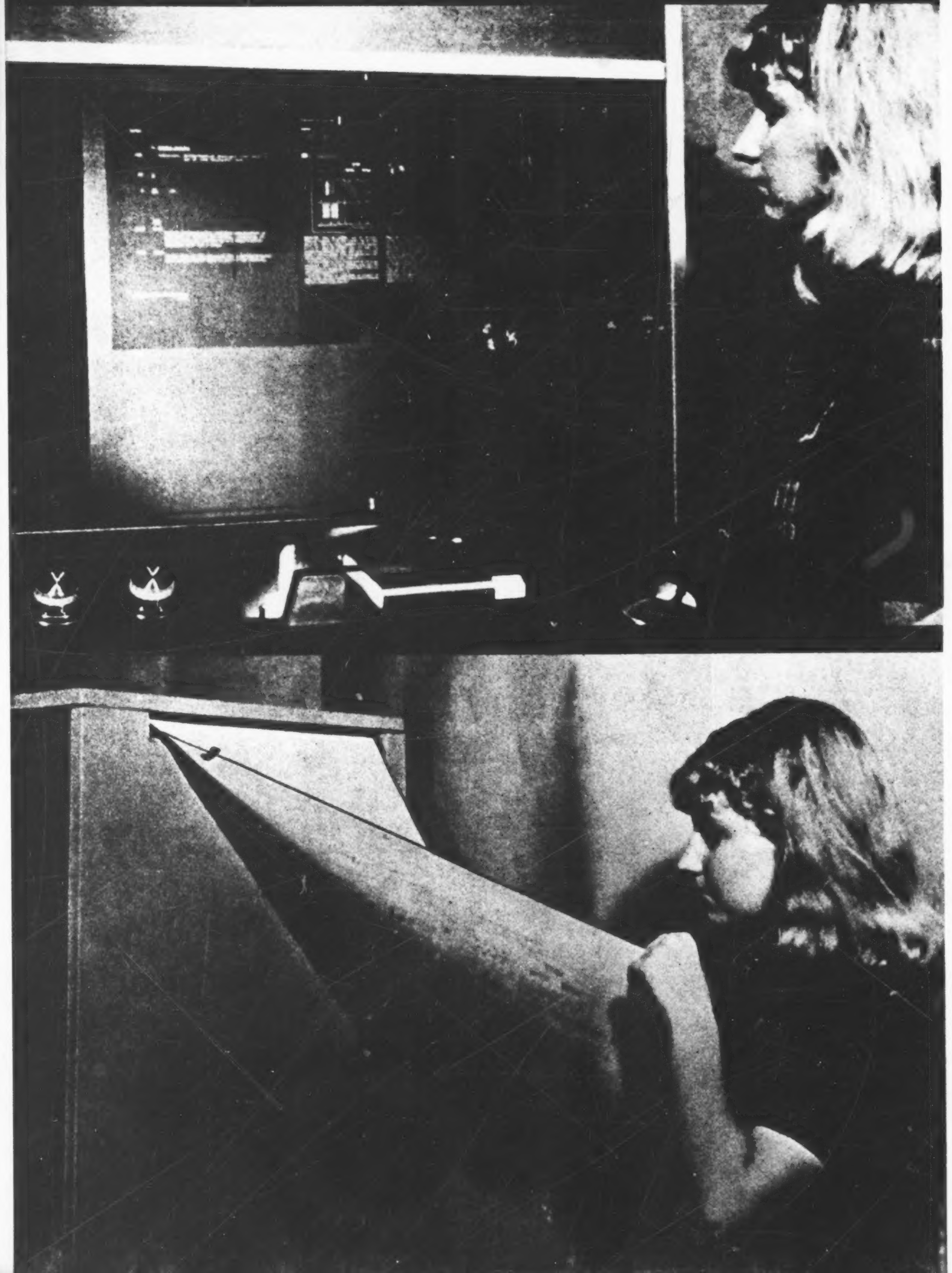
Are the fundamental operations on the set of whole numbers developed one at a time, as inverses, or altogether?

Which programs provide material for slow and fast learners?

Which programs provide tests and supplementary materials related to the texts?

Which teacher manuals suggest specific pre- and post-text activities?

Information Retrieval...



Out of these preliminary curriculum activities, questions will arise for which answers are needed. Specific and authoritative answers can be secured from the system.

POSING THE QUESTION

The questions may be addressed to the system by telephone, a letter, or by personal visit.

SEARCHING THE SYSTEM

A staff member, knowledgeable in elementary school mathematics, will be available at the center to assist the school district in answering its questions.

PROCESSING THE ANSWERS

Answers to the questions may take one of several forms -- a list of page numbers referring to the original text, a narrative, microfilm duplicates, or a copy of the original text pages.

USE THE INFORMATION FROM PRIMES FOR:

- Selection of a mathematics basal textbook series
- Selection of appropriate secondary school mathematics series
- Selection of enrichment material
- Individualization of instruction
- Development of curriculum-related tests
- Placement of transfer students
- Development of teachers' pre-service and in-service programs
- Comparison of published programs

THE SYSTEM DEVELOPS TO PROVIDE

- **Comprehensive, Detailed, and Authoritative Information In Elementary School Mathematics.**
- **Ready Access to The Information File For All School Districts In The Commonwealth.**

As early as 1964 staff members at the Department of Public Instruction considered applying the latest technology of indexing, microfilming, and information storage and retrieval to published material in elementary school mathematics. The project was initiated on January 1, 1965. Extensive field visits, telephone calls, and correspondence to nationally recognized leaders in elementary school mathematics supported the need for developing the system.

The major task in developing the system was to design tools to analyze the diverse mathematics materials that reflect recent curriculum innovations. Drawing upon the research work at the Learning Research and Development Center, University of Pittsburgh, a comprehensive list of about 2,000 pupil objectives, stated behaviorally, was formulated. These objectives were applied to each lesson by trained personnel supervised by the authors of this list.

Similarly, a list of about 300 mathematics concepts and skills was developed by a committee of mathematics educators with Dr. J. Fred Weaver as chairman. Dr. Joy Mahachek directed a group of college professors in applying this list.

In order to devise a system for providing the reference services to school personnel in the Commonwealth a leading firm in information sciences and technology was consulted. Their recommendations are being followed for putting the system into operational use.

PRIMES represents a marked change in the quality of curriculum advisory service that will be available to the local school by a state educational agency. For the first time, local school districts will have access to outstanding experts in mathematics education to assist them in a wide range of problems.

Two levels are planned for advising school districts on their curriculum problems. The first level is searching the file to answer questions that arise periodically in implementing the current curriculum. At this level school districts will be given the opportunity to orient themselves to the system's services.

The second level involves an "in-depth" consulting service. School districts that are planning major curriculum changes, such as selection of a new basal series, will be able to work with the project staff over an extended period of time. The local curriculum committee will participate in a training program to become familiar with the system. Effective use of the system requires completing the preparatory steps described above, continuing school district-system interaction during the period of curriculum development, and follow-up consultation during curriculum implementation.

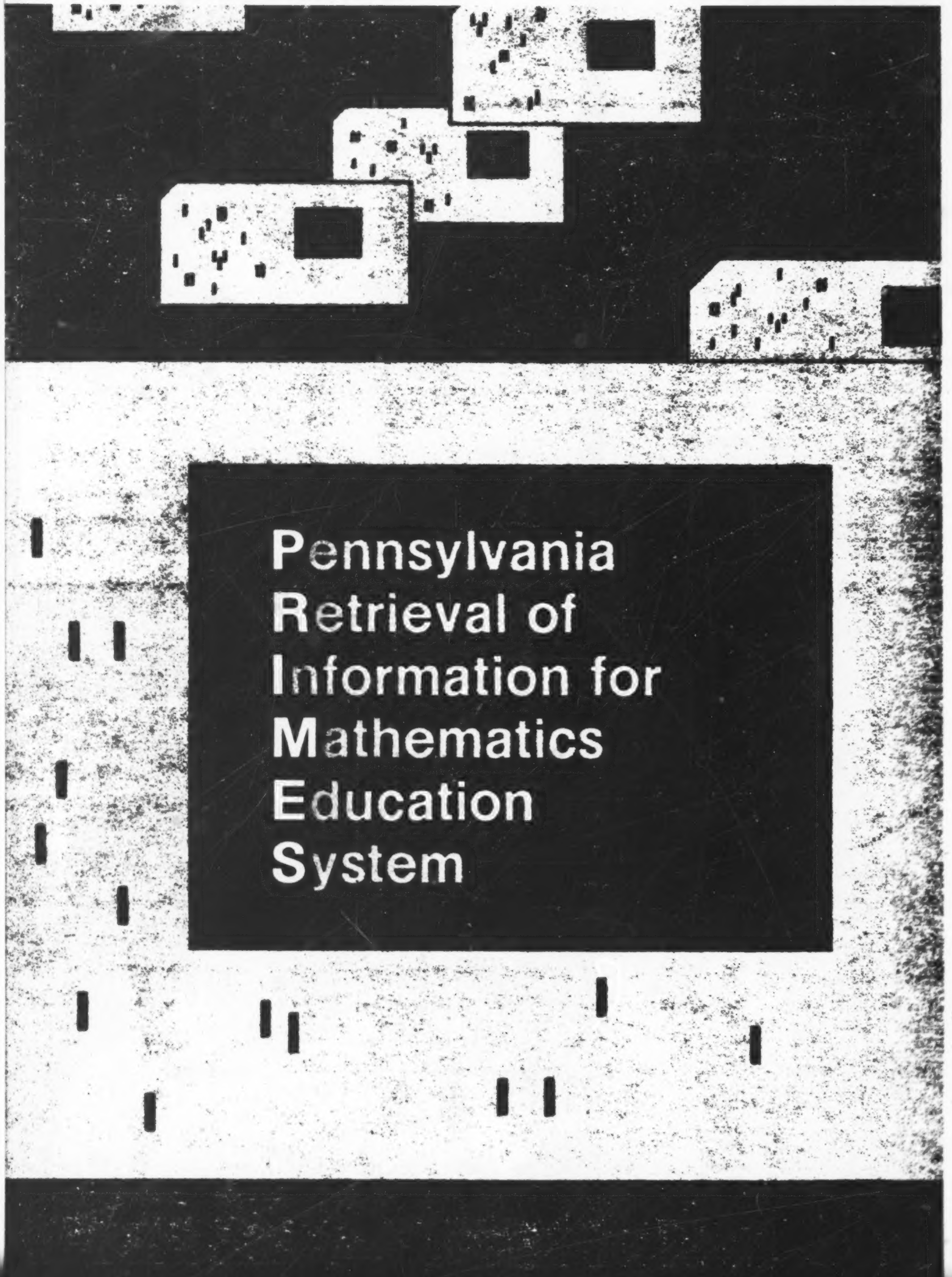
FILE DATA

AUTHORITY LISTS

Content	
Number of categories	350
Number of pages/listing	20
Revisions per year	4
Behavior	
Number of categories	2,000
Number of pages/listing	60
Revisions per year	4

FILES

Document	
Number of programs	18
Number of books	120
Number of pages/book	300
Total number of pages (Kindergarten - Grade 6)	36,000
Number of aperture cards	25,000
Number of 35-mm rolls	72
Index	
Average number of index entries/lesson	8
Total number of index entries	150,000
Number of pages/book-form index (40 entries/column on a two-column page)	3,600



Pennsylvania Retrieval of Information for Mathematics Education System

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